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Improved Sewing Machine.

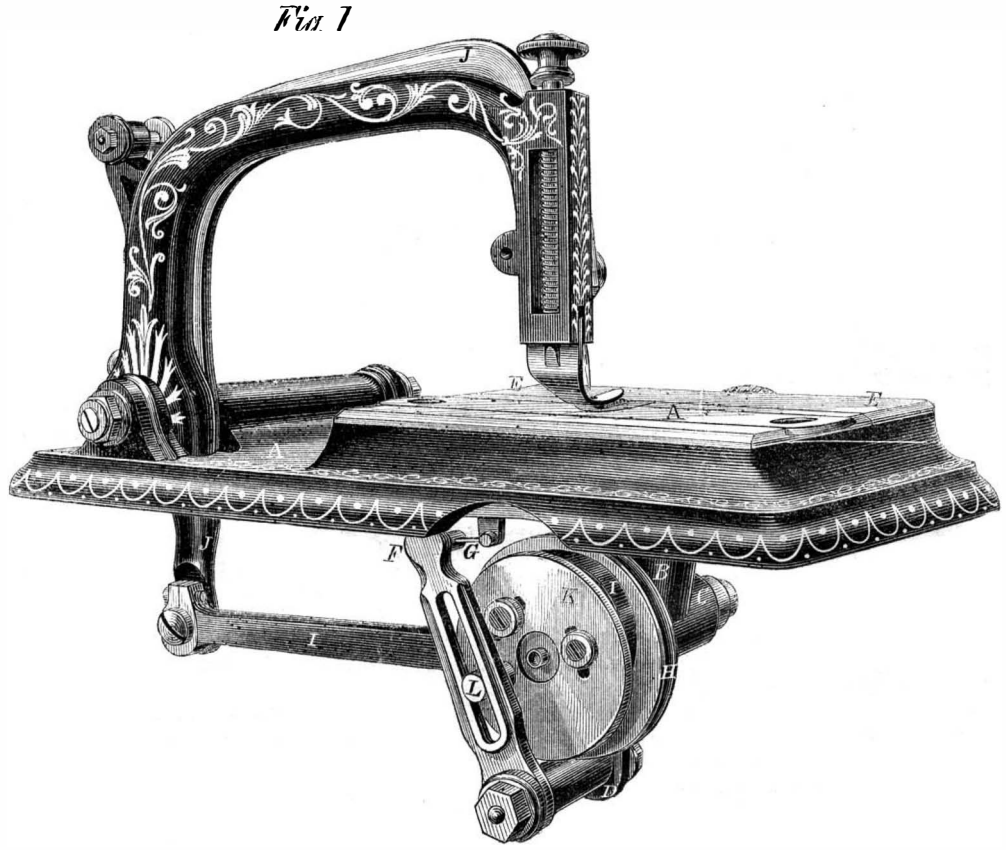
The inventor or author who cuts loose from conventionalities, and strikes out a new path, is certain to achieve a more enduring success than those who accept what is as right in principle and proceed to engraft on that.

Until the year 1852, the mode generally adopted of operating the needle and shuttle in the sewing machine, was to stop each instrument during the operation of the other; this necessitated the use of cams to impart the motion so as to cause the stop or "rest" at precisely the right moment; and up to that time no shuttle sewing machine had been made without cam motions either on the needle or shuttle, or both. In that year the inventor of the sewing machine herewith illustrated commenced his experiments. Rejecting the cam and all other like devices for operating the sewing instruments, as totally unadapted to the inevitable prospective requirements of the machine, and taking the simple elements (needle and shuttle) disencumbered of the usual devices for imparting their motions, he set out to produce a radically new system of mechanism for operating these instruments. In the year 1854 he exhibited to the editors of this journal a shuttle machine with his new combination of movements, the needle being worked as it never had been before in such a machine, viz., by a true eccentric, imparting an easy and continuous motion; while the shuttle, driven by a crank pin, also had a continuous and uninterrupted movement—a combination altogether unlike any sewing machine then known—while the whole construction was exceedingly novel and very simple. This, we believe, was the first shuttle sewing machine ever made having continuous or crank motions. Since then Mr. Smith has obtained, in all, eight patents for improvements looking to the perfection of this class of machines, in nearly all of which the continuous or crank motion prevails throughout.

In the present machine he has embodied some of the most important results of his experiments for the past twelve years, making a lock stitch by a needle and shuttle having continuous or crank motions imparted by a very direct and simple mechanism. The needle and shuttle are also operated or moved relatively, so as to draw the threads into the work in a manner that adapts the machines especially to thin fabrics, while the usual adaptability to heavy work, which characterizes the shuttle machine, is retained intact.

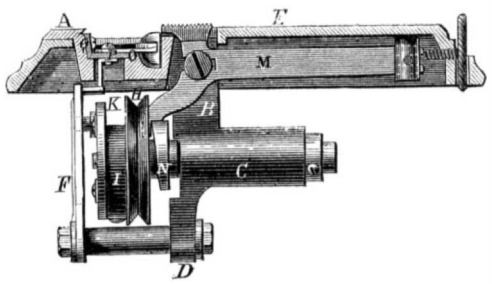
Fig. 1 is a perspective view of the machine, and reveals all the working parts except the feed bar, which is seen in the sectional view, Fig. 2. All the working mechanism, except the needle arm, is arranged upon a single casting, consisting of the shuttle race, A, hanger, B, boss, C, and pendent, D. This casting is set into an opening made for the purpose in the bed plate, E, and secured therein so as to form a part thereof. The boss, C, is the bearing of the main shaft, and the pendent sustains the fulcrum pin of the vibrating lever, F, which gives the reciprocating motion to the shuttle driver through the connecting link, G. The driving pulley, H, has an eccentric cast on the outside, which is encircled by one end of the strap or connection, I, and the other end is attached to the lower extremity of the needle arm, J. To the eccentric is attached a disk, K, with a crank pin, L, moving in a groove or slot in the lever, F.

Fig. 1



EARLE HARRY SMITH'S CRANK-MOTION SHUTTLE SEWING MACHINE.

Fig. 2



The disk is adjustable on the eccentric for the purpose of timing the needle and shuttle. The feeding device (see Fig, 2) consists of the bar, M, which has an up-and-down and back-and-forth movement imparted by an eccentric, N. O is the shuttle driver; it is attached to a slide, P, and receives its motion from the vibrating lever, F. The slide, P, runs in a dovetail groove, one side of which is solid, and the other formed of an adjustable plate, Q, by which it is always kept up to its bearings.

All the movements of the machine being continuous, and effected by the crank or eccentric, it is evident that the machine will run very quietly.

No rattling nor backlash can occur, as every part is made adjustable, to follow up the wear, thus imparting the highest degree of durability.

The simplicity of this machine is apparent, indeed it would be difficult to produce the three independent movements of needle, shuttle and feed, with a less number of actuative parts.

These sewing machines are made by the Continental Manufacturing Co., No. 18 Beekman street, (A. W. Goodell, Agent, Box 3,631), New York.

The patent for this invention was allowed on Sept. 7, 1865; the invention has also been patented in great Britain and France, and other foreign patents are pending.

Rock-boring Machine.

The steam artesian well-borin gmachine, at Cardiff, Wales, belonging to Messrs. Mathan and Platt, of Manchester, has been at work for some weeks at a brewery, in order to procure water for cooling, etc. Day after day passed away without any signs of water, the huge machine bringing up tuns of solid rock. After boring to the depth of 290 feet, an apparently inexhaustible supply of water, of excellent quality, was got. Steam-pumps arrived from Manchester, and 160,000 gallons were brought up in twelve hours. The machine's mode of operation is by a circular row of chisels; with an inner row, standing in an oblique direction, and then falling on a mass of stone with the force of several tuns, breaking the stones into small fragments, which are then drawn up by an exhausted receiver, and the chisels are then made to work on a fresh surface. The diameter of the hole is regulated by the circumference of the socket holding the chisels. The machine can bore a hole 4 feet in diameter, but the wider the surface the force is the more diminished. In the present instance the bore was only 18 inches. An average of 27 feet 8 inches of well was sunk per week during the operation of the machine. The cost per foot was 19s. 4d. The cost of the machine was £600, but it was let, including boiler, at the rate of £6 a week. In Yorkshire the machine had bored through 40 feet of hard stone, used as mill-stones. In boring for any great depth, it was found cheaper, after boring 300 or 400 feet, to reduce the diameter from 18 to 15 inches. The machine has bored wells 4 feet in diameter, and 50 feet deep as at Birkenhead. The cost was not increased in the same ratio as the diameter. If required to sink a pit shaft 12 feet or 18 feet in diameter, a series of holes 2 feet in diameter would be sunk, as the practical limit of the machine is regarded as being 2 feet in sinking a single hole.—*London Builder.*

EXPERIMENTS on the N. Y. Central railroad with peat show that 2,800 lbs. of peat will run an engine about 175 miles.

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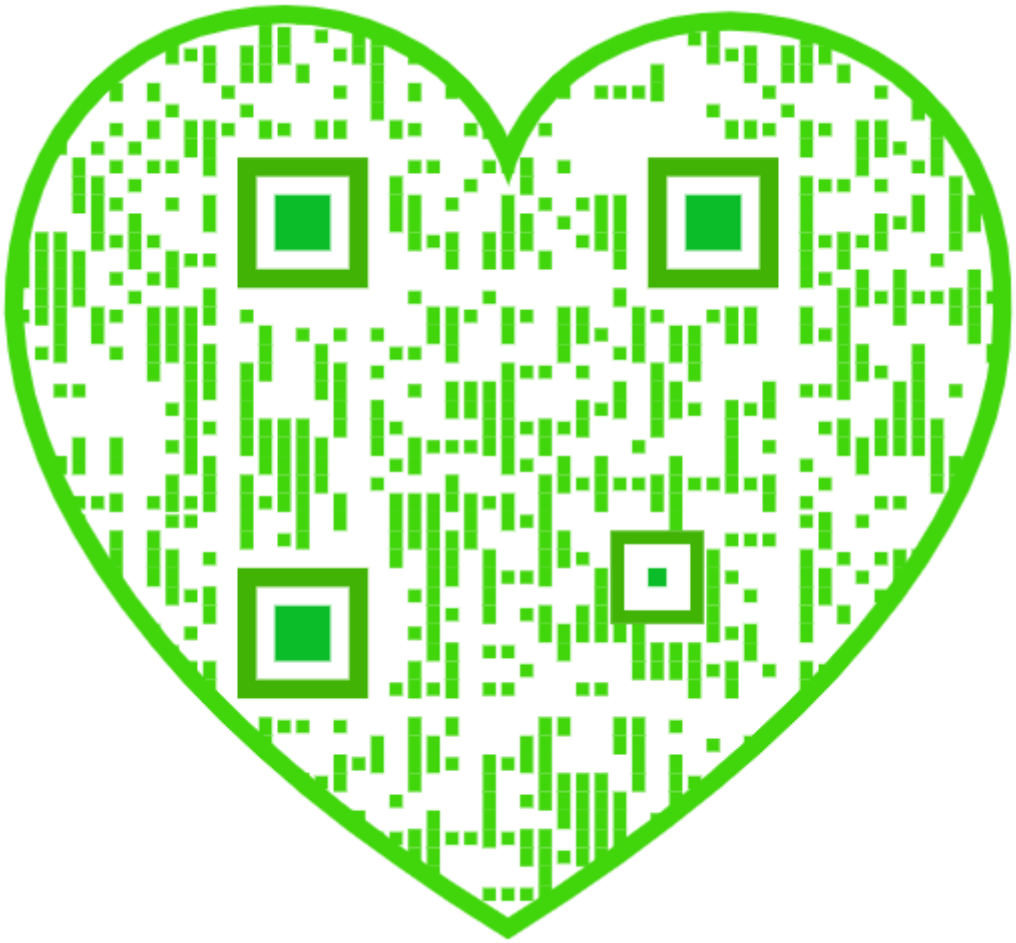

DRAPER'S CIVIL POLICY OF AMERICA.

Professors Lewis Agassiz and John W. Draper are the most eminent representatives of the least numerous but most welcome class of those who have transferred their residence from Europe to this country—men of high intellectual culture. In taking up a new work of Dr. Draper's we expected new evidence of untiring application, of large acquirements in every department of knowledge, and of even too great facility in bold and broad generalization; but the melodious eloquence in which the great argument is clothed we did not anticipate.

It has been a favorite notion of Professor Draper's that the moral and mental characteristics, the civilization and the institutions of the various races of men, result mainly from the climate and other physical conditions by which they are surrounded, and he has written this work to show the application of his views to the present and future condition of the United States. The following extracts will show—better than any description or criticism of ours—the general drift of the author's thought, as well as the charming style in which he gives it utterance:—

"Nations, like individual men, are born and die—an unpalatable truth, for each tries to hide from itself the contemplation of its final day. Each also amuses itself with the delusion that, whatever may be the hapless lot of others, there is an immortal future in store for it. But what does the inexorable hand of History write? Rome, Macedon, Persia, Assyria, Egypt, all are gone.

"The waves of the ocean spring up, we know not where or why. They come careering past us, the very emblems of resistless power. They subside and are lost among other succeeding waves. In like manner, on the vast sea of human life, empires mysteriously emerge. They raise their ephemeral forms conspicuously high, overwhelming whatever stands in the way of their march. They also subside and are lost, but the unfathomed abyss of humanity still remains.

"To the infinite expanse of the ocean belongs endless duration. Its waves are only temporary. The forces that have impelled them into existence are soon expended; an inevitable disappearance awaits them. The material of which they are composed may be eternal, but they themselves are only vanishing forms.

"Vanishing forms! Such, too, are nations emerging from the mass of humanity.

* * * * *

"But let us take courage. Once in the history of the world has a parallel attempt at the union of a continent been made. In the eleventh century was born a great man, who resolved to convert all Europe into one federation, with the Sovereign Pontiff at its head, and emperors and kings his proconsuls—that Europe which, as we have seen, presents all sorts of climates and all kinds of modified men. A religious foundation was, under the circumstances, the only one that could be given to the contemplated structure; but Gregory VII. saw not only its capabilities, but its defects, as any one may find who will consider his relations with the heretic Berengar. Those defects he would have remedied if he could, and brought that foundation into more complete accordance with human reason.

"What was the practical instrument on which Gregory VII. relied in carrying out his intention? His legates could pass from Scotland to Spain, from the Atlantic to the confines of Asia, and meet in every monastery and at every church men speaking the same tongue. The Latin language gave him intelligent allies all over Christendom, but allies only among the men of education. With us, how much better is the prospect—one language from ocean to ocean, and that among the lowly as well as the high. That bond of union is for us a bond of strength. It aids in compensating for diversities of climates. It gives us a common history of the past, a common hope for the future. Conterminous groups of men are far more effectually isolated by different forms of speech than by intervening rivers and mountains, but groups that are far apart may be in communion through a common tongue. They may learn to have faith in the greatness and permanence of their political creations, and in unbroken unity discern unconquerable power.

"With such an inappreciable advantage in our favor, we are encouraged to look again at the great problem before us, and to ask, Can we not neutralize those climate differences, which, if unchecked, must transmute us into different nations?

"In two words, I think, we find an answer—Education and Intercommunication. Nor is this the suggestion of mere theorists. Under that formula four hundred millions of men—one-third of the human race—have found stability for their institutions in China. By their public school system they have organized their national intellect; by their canal system they have made themselves, though living in a climate as diversified as ours, essentially one people. The principle on which their political system is thus founded has for many thousand years confronted successfully all human variations, and has outlived all revolutions. But what is their public education compared with what ours might be? what is their canal system compared with what our railroads will become?

"Of education I shall have nothing more to say, for all intelligent persons concur in the belief that it is absolutely necessary to the perpetuity of the American system. The public value of locomotion is by no means so well understood. While legislation has in all directions been brought to bear on the protection, encouragement, development of the former; the latter, it may be said, has been altogether neglected in a national point of view.

"Talleyrand, when speaking of the United States to the Emperor Napoleon, made this remark: 'It is a giant without bones.' That was before there were any railroads; but since his day the bones have begun to grow, and they are bones of iron.

* * * * *

"That love of the homestead, so characteristic of the settled populations of Europe, can scarcely be said to exist among us. The children leave their father's hearth without reluctance, for he is perpetually anticipating leaving it himself. It might have been feared—perhaps was feared by many observant persons—that this loss of local patriotism would imply the loss of national sentiment, but the experience of the civil war has shown the incorrectness of such a foreboding. The history of the world cannot furnish a more splendid example of unwavering fortitude, unshrinking self-sacrifice, in vindication of national life. The acts of which it has been our privilege to be eye-witnesses, will by future generations of Americans be pointed to with pride as the greatest glory of their history—an incentive in their inevitable march to imperial greatness, a firm support in their days of trial."

We are tempted to continue our extracts, but want of space admonishes us to refrain. The whole work will be read with interest and satisfaction by every statesman and every man of thought into whose hands it may fall. The pleasure of reading it will be enhanced by the elegant paper, type and binding in which Messrs. Harper & Brothers have presented it to the world.

Apparatus for Canning Fruit.

A novel and useful apparatus for putting up fresh fruit in its juice is thus described by the *Ohio Farmer:*—

"It is a steam closet, made like an upright case of drawers; is about twenty inches square and six feet high; has a door which can be fastened at top, middle and bottom with iron keys in bolts, as shutters are fastened on store windows—all steam-tight. The peaches are peeled, cut in halves, put in tin pans to fit the inside slides of the steam closet; the closet is filled with these pans of fruit, the door closed and keyed, steam let on with a powerful fizz for two or three minutes, then shut off, the doors opened and the pans set upon tables, where the girls pick up the pieces with forks and put them in cans; the cans thus filled are passed along to the end of the tables, where there is a cauldron of rich sirup made of crushed white sugar, a dip of which is poured in to fill the spaces among the fruit, and the cans are sealed up. This steaming is much better than the old boiling process, as the watery juices are got rid of, also the acrid juices which are secreted under the rind of the peach, all of which, being left in the pans, are poured into a vat and there converted into peach brandy. By this steaming, also, the shrinkage is taken out, and the fruit goes into the cans as clear and white as we see it in prize jars at the fairs, while the sirup which takes the place of the watery juices makes a rich sauce when they come to the table."

Wants Unsupplied.

The labors of another haying season—a season about terminating, and one which has given employment to a greater number of machines of various descriptions than has heretofore been employed—have taught several lessons which should not be forgotten, and we allude to one or two now, hoping that some one will improve upon our suggestions and endeavor to aid in perfecting what so much needs to be accomplished.

1. A better horse-rake is needed. We have witnessed the operation of many different rakes the present season, and are satisfied that they are all more or less defective. Whitcomb's rake is highly recommended, and is, perhaps, as good as any in use among us, but, after having examined its operations upon several fields, we are satisfied it can be much improved, or wholly superseded, by a rake that will give better satisfaction. It is too long in unloading. The horse travels three feet or more while the hay is dropping from the elevated rake, consequently the windrow is loose, flat and uneven, and requires considerable labor with the hand-rake to put it in shape to bunch up to advantage. Could the rake be elevated and dropped quicker, or the form of the teeth so constructed as to clear itself of hay sooner, it would be much better. The true principle of a horse-rake is the revolver. It rakes cleaner and makes a better windrow. But the old revolver possesses many disadvantages, which, we think, are overcome in Wallace & Carpenter's wheel revolver. The latter is a rake we think very highly of, although it is somewhat complicated.

2. We want a better contrivance for unloading hay, The horse pitch-fork was a great improvement over hand power—especially in conveying hay to the top of high mows, and even now it is the best thing of its kind in use. But we want a contrivance to unload a rack full of hay at a time. We believe that carts and barns can be so constructed that with a single pull of a horse a load of hay can be dumped at once into the bay. This cannot be done of course after a certain amount of hay has been hauled in, but we believe with a little Yankee ingenuity the thing can be accomplished, and all barns now built be so altered that the thing would work.

Other improvements in machines for performing farm labor will suggest themselves to observing men, who are invited to communicate the same.—*Maine Farmer.*

New Artificial Light.

Mr. James Wilkinson, of Chelsea, is endeavoring to rival the magnesium light, for photographic purposes, by means of a mixture of phosphorus and nitrate of potash. He recently burnt a quarter of a pound of this mixture in his garden, at night, with a view to obtain a photograph of a wind engine which was being erected in an adjoining garden, and he states that "the length of time from when it was first lit until it was finally burnt out was nearly six minutes. The utmost cost was a fraction over fourpence. The reflection of the light might be seen for two miles round. So bright was it that the fire-engine authorities mistook it for an ordinary conflagration, and hurried their engines to the spot. Upon finding no trace of the fire they returned, rather chagrined, not, however, without first satisfying themselves by a thorough examination of the premises. All around appeared one blaze of light, the sky looked like a mass of fire." The picture taken during this startling illumination "came out," we are told, "with great sharpness and vividness, the houses near being brought out prominently. It, in fact, equaled any picture taken on a bright day."—*Mechanics' Magazine.*

OAKEN barrels may be prevented from coloring spirit by dissolving one part of ammonia alum and two parts of sulphate of iron in one hundred parts. Well wash the casks with this solution, boiling hot, and allow them to stand twenty-four hours. Then rinse out the casks well, dry them, and finally give them a washing with a thin solution of silicate of soda.

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RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Paper Holder.—This invention consists in a novel mode of constructing paper holders, for holding files of newspapers, and also documents and letters, the same being composed of two strips of wood or other light material, which are secured to each other so as to embrace the files of paper between them by means of a screw clamp of a peculiar construction, and provide space for gathering and folding the lower part of large newspapers, to accommodate the reader when he wishes to read the head of its columns. J. W. Foard, of San Francisco, Cal., is the inventor.

Chambering Artesian Wells.—The object of this invention is to produce an implement or apparatus by means of which the bottom of an artesian well, or any other part thereof, can be chambered out or enlarged in diameter, and it consists in a tube which carries, in a diametrical chamber at its lever end, a horizontal drill capable of being driven outward beyond the periphery of the tube, in order to cut away the sides of the well when the tube which carries it is rotated. George F. Case, of Brooklyn, N. Y., is the inventor.

Horse Collar.—This invention consists in constructing a horse collar with a wooden front portion, the rear being of leather or other flexible material, stuffed or padded, said wooden portions being provided with a leather yoke or pad, and connected by a strap, whereby a great saving is effected, both in labor and material, and a very easy and comfortable collar for a horse obtained. C. J. Fisher, of Waukon, Iowa, is the inventor.

Axle Box.—The metallic boxes, for the wheels of vehicles are, at present, made of cast iron, and as soft as possible in order to admit of the interior of the box being bored out and polished or finished perfectly true, in order to run well on the axle and avoid unnecessary friction and consequent wear and tear. Hard boxes would be far more durable than the soft ones, if they could be worked after they are cast; chilled cast iron, for instance, would answer an available purpose, but the difficulty alluded to precludes its use. The object of this invention is to obtain a box which will be hard and durable, and still admit of being bored out and polished, so as to run perfectly true on the axle. To this end the invention consists in constructing the box of wrought iron, and after boring and polishing its interior surface perfectly true, rendering the same hard by the ordinary process of case-hardening, or of steel-converting. Charles Cook, of Winsted, Conn., is the inventor.

Combined Bureau and Commode.—This invention consists in combining, in one and the same piece of furniture, a bureau and commode, the commode being so arranged, with regard to the bureau, that it can be moved out and in at pleasure, according as it is desired or not to use it—the commode, when not in use, being wholly incased within the bureau. By this combination a very neat, simple and compact piece of furniture is obtained; and in addition to a bureau and commode, other necessary articles, used for similar purposes to the commode, are also arranged in connection with it; the whole presenting a most convenient and desirable piece of furniture, worthy the examination of furniture manufacturers. George W. Koch, of No. 150 Wooster street, New York, is the inventor.

Basket.—This invention consists in making the base of baskets, hampers, and other similar structures, in such a manner as to protect the bottom and corners from injury and wear, the base being formed with as many sides as there are sides to the basket, each side being a solid piece, and the several pieces being framed or joined together at their ends in any suitable manner. E. B. Lyman, Waterbury, Conn., is the inventor.

Baling Press.—This invention relates to a press in which the follower can be operated by a slow and by a quick motion, which are combined so as to form a compact and comparatively light and easy-working mechanism. The slow motion consists of a hollow screw spindle which screws into a worm-wheel gearing into a worm and it connects with the follower by a rod which passes clear through said screw spindle, and is connected to it by a suitable key. The extreme end of this rod forms a toothed rack, which gears in a suitable pinion, and if the key which connects said rod with the hollow screw spindle is withdrawn the pinion and rack form the quick motion for the plunger, which can be used independent of the slow motion. Joseph P. White, No. 418 Greenwich street, New York, is the inventor.

Apparatus for Steeping, Growing and Drying Malt.—This invention consists in effecting the malting operation by means of an apparatus composed of a wire-gauze cylinder mounted on a hollow shaft, through which steam is admitted to the helical heating pipe in the interior of the wire-gauze cylinder, in combination with a cylindrical case, one half of which is surrounded by a jacket, in such a manner that the steeping, the growing and the drying can be effected without removing the malt from the apparatus, and not only much time and labor is saved, but also a better product is obtained than by the ordinary malting process; and, furthermore, the malting, operation can be effected in the hot season as well as in winter time. A. Kreusler, of New Lebanon, N. Y., is the inventor.

Ventilator for Hats and Caps.—This invention relates to a ventilator for hats and caps, which is constructed of a supporting plate of sheet steel or other pliable material, in combination with a spring or a narrow strip of hardened sheet steel, or other suitable material, which is fastened to the supporting plate, leaving a crescent-shaped space between its outer surface and the inner surface of the supporting plate, in such a manner that, by means of the supporting plate, the ventilators can be readily secured in a hat or cap, and through the crescent-shaped space sufficient air finds access to the interior of the hat or cap to cool the brow of the person wearing the same; and, furthermore, by the flexible spring the ventilator is free to accommodate itself to the shape of the head without throwing the hat or cap out of shape. A. Komp, No. 184 Fulton street, New York, is the inventor.

Device for Holding Reins or Harness Lines.—Much annoyance and embarrassment are caused, on leaving a horse and carriage standing for a time, by the necessity of contriving some way of securing the lines in a manner that will prevent their getting under the horse's feet; the object, therefore, of this invention, is to provide a simple device, to be attached to the dash-board of a carriage, which will clamp the reins and hold them firmly until again required for driving the horse; and it consists in the construction of a wooden or metallic clamp, which is to be secured to the dash-board of a carriage, and which has two jaws, arranged so as to be pressed together by suitable springs, into which the reins are placed, when they will be firmly held until removed. T. L. Tripp, of Prescott, Wis., is the inventor.

Drill for Boring Oil and other Wells.—The object of this invention is to produce a drilling apparatus which will remove the broken and pulverized rock from the lore, and collect it in the rod of the drill, at the same time discharging the water from the rod, so as to allow the heavier matters to be retained in the rod until the receptacle provided for them is filled. This is accomplished by means of a tubular drill rod containing a central tube, which is directly above the valve box, and an annular chamber surrounding said tube, and communicating therewith by means of perforations in the sides of the tube, through which the detritus is received into the annular chamber. Lewis H. Bowman, of Norristown, Pa., is the inventor.

Manufacture of Writing Fluid.—This invention consists in the use of an ink or writing fluid composed of an acid and coloring matter that can be combined therewith, to be used in combination with a paper, the color in which may be discharged or changed by each acid, and the texture of the paper also changed or weakened by the action thereof, in those parts that are written upon, and the possibility of alteration and erasure is prevented. Henry C. Bailden, of Edinburgh, Scotland, is the inventor.

THE Farmers' Club has adjourned for four weeks.

MISCELLANEOUS SUMMARY.

PEAT.—The editor of the Lewiston *Journal*, having made a visit to Mr Farwell's peat bog, says:—Mr. F. estimates that it costs him three dollars per cord to get the peat to his bleachery; and he considers a cord of peat as valuable as a cord of wood. Estimating the wood at eight dollars per cord, there is a saving in the use of peat of five dollars per cord. Now Mr. F. has from forty to fifty acres in his peat bog, and the peat will average three feet in depth, giving certainly one thousand cords for the acre, or fifty thousand cords for the whole bog. Profit per cord $5; profit on 50,000 cords, $250,000.

THE value of water-tight compartments in steamers was well illustrated in the case of a collision on Lake Huron, one of the unfortunate vessels having been taken into port sixty miles or more from the scene of the accident, an unsightly wreck forward, great plates of iron hanging by shreds, bent, twisted and torn, but the joints of her first partition tight as a steam boiler.

LARGE fields of cotton are growing in California—over one hundred acres in one field looking well. The State of California offers a bounty of $3,000 for the first one hundred acres of cotton—also $3,000 for the first one hundred bales of three hundred pounds each. Over $100,000 is donated by the State for the encouragement of agriculture, in the raising of various products.

THE Russian Government has lately given up the working of its gold mines in the Ural Mountains, and has arranged for them to be worked by private enterprise. The results of this change have been very remarkable. The quantity of metal extracted is now increased ten-fold.

A NEW RAT TRAP.—Take a smooth kettle, fill to within six inches of the top with water, cover the surface with chaff or bran, place it where the rats harbor, and it will drown all that get into it. Thirty-six were taken in one night by this process.

IT is stated that there is not a single tun of iron in the whole Lehigh Valley remaining unsold at the present day, and many of the establishments have orders ahead.

New Fuel.

A newspaper of Tepic, Mexico, speaks in high terms of a late discovery that has been made to apply to purposes of fuel the stone of the guacoyol, the fruit of a species of palm that grows on the Pacific side of Mexico. From experiments made on board of English war steamers, it has been discovered that, used as fuel, the stone of the guacoyol is equal to the best coal, both for the length of time it burns and the intensity of heat produced. It has likewise the advantage over coal, that there is no disagreeble smell from the exhalation of gas, nor does it dirty the holds, nor the persons who have to take it out; its shape is also in its favor for employing directly, and it is not subject to spontaneous combustion or damage by leakage of the ship.

The guacoyol, as already stated, is the fruit of the palm with which nature has covered the Mexican coast of San Blas and the valley of Banderas. The quantity of this fruit which can be collected annually is incalcuable. Thousands of tuns, says the Tepic newspaper, can be gathered at a very slight expense, and easily supply all the steamers of the Pacific coast—the difference of price between it and coal at San Francisco being about one-half. The objection is that the supply can only be temporary, as the daily consumption of one vessel would take the produce of thousands of trees to supply it.—*Mining and Petroleum Standard.*

Aniline Colors.

Few of the aniline colors will stand the continued action of light; to which difficulty must be added, in the case of oil painting, their rapid decomposition by the common varnishes, which mostly contain metallic oxides. A recipe has been furnished us for preparing these colors in a manner to avoid all objections. The dye is to be dissolved in alcohol; this solution is to be saturated with gum dammar, the filtrate to be poured into a solution of salt water, and dried. This is then incorporated with an oil varnish which must be free from lead.—*Druggists' Circular.*

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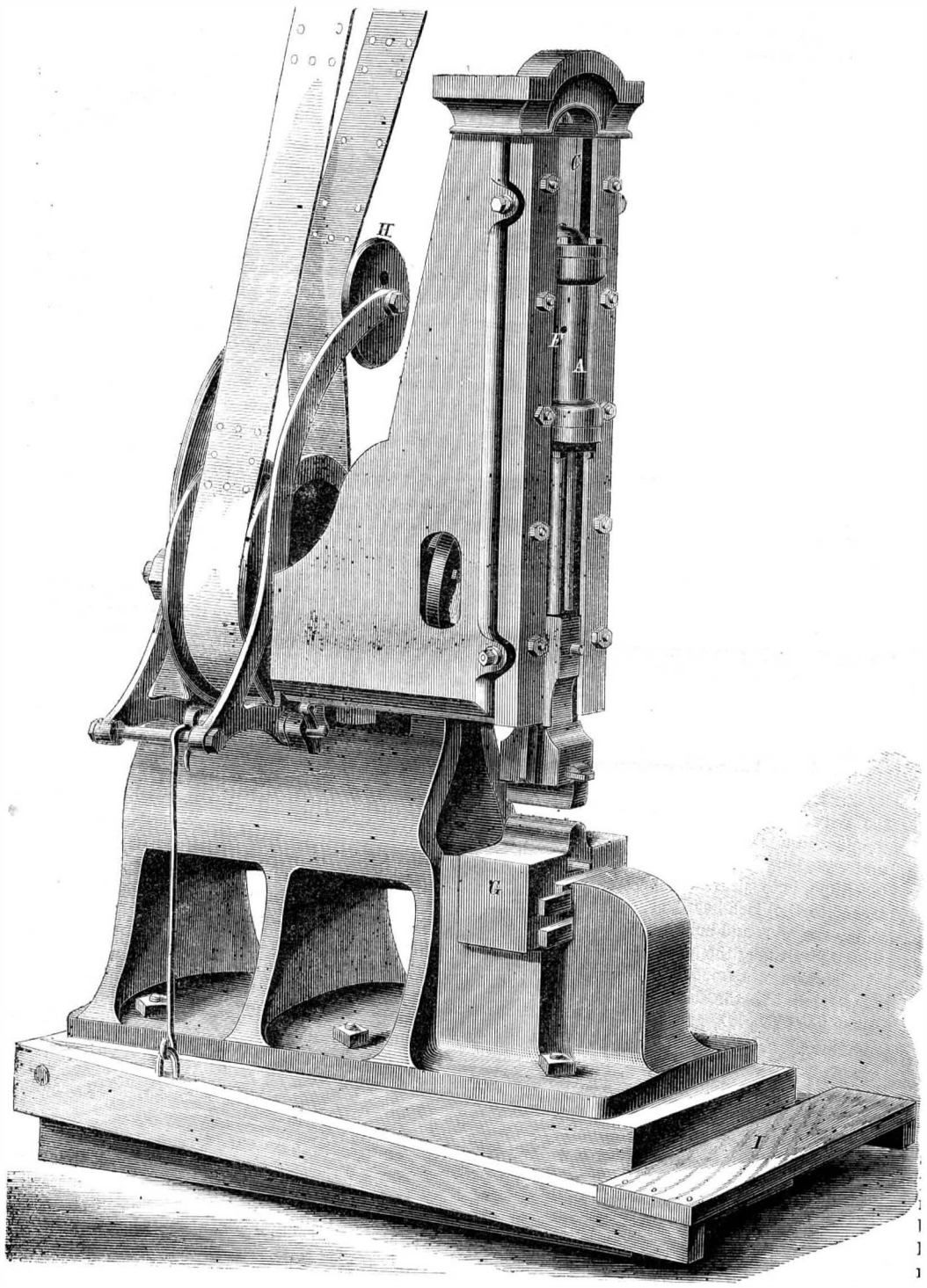
Improved Atmospheric Hammer.

This hammer is highly approved of by many of our largest machine makers, and over forty are now in use in different parts of the country. It can be managed with great accuracy, will strike a light or heavy blow, runs rapidly, and is under perfect control. We regard it as a useful machine where die or other work has to be done. We never publish certificates in connection with our illustrations, and are therefore obliged to omit those shown us by the manufacturers, who will be happy to furnish them by mail. This hammer works by compressing air in the cylinder, the cylinder itself sliding up and down between guides. The following description will render it intelligible:—



HOTCHKISS'S ATMOSPHERIC HAMMER.

The air is compressed by a cylinder, A, and piston, B, (see Fig. 2). The cylinder moves in the slides, C, by the action of the connecting rod, D, driven from the face plate, E, by belting, in the usual manner. There are two small holes, F, in the cylinder, A; through these the air enters. The whole machinery is carried in a strong iron frame. Now, if we suppose the cylinder to ascend, the air will enter through the holes, F, and be compressed as the cylinder goes up. This compression is at the bottom of the cylinder, and therefore lifts the hammer moving in the slides. By the time the hammer is lifted the connecting rod arrives at the top center and commences to descend. The air then enters above the piston, and as the cylinder still comes down condenses the volume very highly. This condensed air is the force stored up to make the blow, for so soon as the connecting rod turns the bottom center, the confined air expands instantly and thus throws the piston and hammer down with great force. This action is repeated at every revolution, and the hight of the cylinder is altered so as to forge large or small work by lengthening or shortening the connecting rod. The hammer is lifted at the ascending stroke by the compressed air below, as we stated previously, and this also aids the cylinder in compressing the air for the return blow, and it is owing to the rapid action of the two movements that the piston does not fall before it obtains the advantage of the air compressed above it.

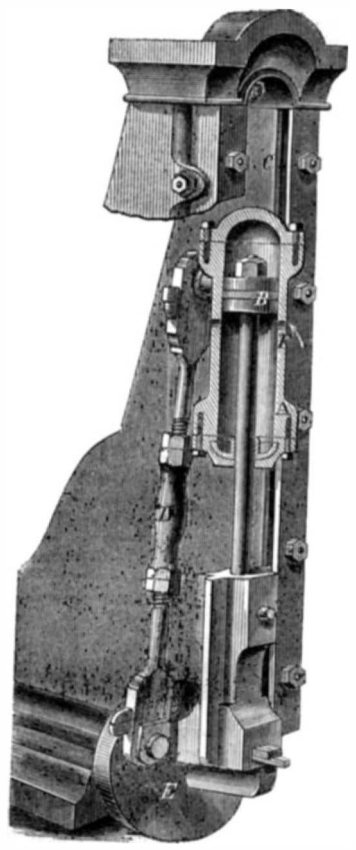
It will be seen that this hammer is exceedingly simple in its construction; there are no valves about it to get out of order, and the packing is exceedingly durable and easy working. Both that in the piston and in the cylinder head is made of the cup-leathers used in packing hydraulic rams, and they have run for months without leakage or perceptible wear. The dies are fastened in with keys, and the anvil block, G, is adjusted by another key, so that the dies can be set properly without delay. The speed of the hammer is regulated by an idler pulley, H, which can be operated by the treadle, I.

The patent bears date May 3, 1864, and was issued to Bennett Hotchkiss, of New Haven, Conn. For further information address the sole manufacturers, Charles Merrill & Sons, 556 Grand street, New York City.

Lactometers Not Reliable.

Mr. Theodore Moith, of Fishkill, writes to the New York *Times* as follows:—

"A few days ago you advised the milk consumers to arm themselves against the adulteration of milk with an instrument called a lactometer, made on the same principle as all other aerometers. Now, it the milk of all cows, despite all difference in feeding, season of the day and year, temper and quality of the cow,



similarity of adulterating substances, would always show in its pure state the same specific gravity at a certain temperature, a lactometer would be the thing. But under existing circumstances it is the most fallacious of the many got up for that purpose. The most eminent chemists in Europe have come by this time to this conclusion. You can buy in your city, at any chemical store, these lactometers at seventy-five cents per piece, but in the hands of the public they would prove a nuisance, and would make any smart milk-dealer chuckle in his sleeve, as nothing is so easy as to give milk the proper specific gravity. In Europe they havs used a number of different contrivances, whereby the police tried to control that class of trade, but to no purpose. Till something more suitable turns up it would be best for the people to patronize the manufacture of condensed or solidified milk, as these manufacturers, from the nature of their business, can only work well with pure milk, and have, or can have, the scientific control these demands. One of the simplest, best, worth relying on, is: To evaporate the milk over a water-bath and find the solid constituents of the milk. This amount, in average milk, is from 12 to 14 per cent. But these easy tests would require at least an outlay of $2 or $3 for a scale, besides some hours' patience."

National Debt.

	Amt. Outstanding.	Interest.
Debt bearing interest in coin	$1,108,310,191 80	$64,500,590 50
Debt bearing int. in lawful money	1,274,478,103 16	73,531,037 74
Debt on which interest has ceased	1,503,020 09	.....
Debt bearing no interest	373,398,256 38	.....
Total	$2,757,689,571 43	$138,031,628 24

LEGAL-TENDER NOTES IN CIRCULATION.

	Amount.
One and two years' five per cent notes	$33,954,230
United States notes, old issue	402,968
United States notes, new issue	432,757,601
Compound interest notes, act of March 3, 1863	15,000,000
Compound interest notes, act of March 30, 1864	202,024,160
Total	$684,138,959

The foregoing is a correct statement of the public debt as appears from the books, Treasurer's returns and requisitions in the department on the 31st of August, 1865.

HUGH McCULLOCH,
Secretary of the Treasury.

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Armenian or Diamond Cement.

This article, so much esteemed for uniting pieces of broken glass, for repairing precious stones, and for cementing them to watch cases and other ornaments, is made by soaking isinglass in water until it becomes quite soft, and then mixing it with spirit in which a little gum mastic and ammoniacum have been dissolved.

The jewellers of Turkey, who are mostly Armenians, have a singular method of ornamenting watch cases, etc., with diamonds and other precious stones, by simply glueing or cementing them on. The stone is set in silver or gold, and the lower part of the metal made flat, or to correspond with the part to which it is to be fixed; it is then warmed gently, and has the glue applied, which is so very strong that the parts so cemented never separate; this glue, which will strongly unite bits of glass, and even polished steel, and may be applied to a variety of useful purposes, is thus made in Turkey:—Dissolve five or six bits of gum mastic, each the size of a large pea, in as much spirits of wine as will suffice to render it liquid; and in another vessel, dissolve as much isinglass, previously a little softened in water, (though none of the water must be used,) in French brandy or good rum, as will make a two-ounce vial of very strong glue, adding two small bits of gum albanum, or ammoniacum, which must be rubbed or ground till they are dissolved. Then mix the whole with a sufficient heat. Keep the glue in a vial closely stopped, and, when it is to be used, set the vial in boiling water. Some persons have sold a composition under the name of Armenian cement, in England; but this composition is badly made; it is much too thin, and the quantity of mastic is much too small.

The following are good proportions:—Isinglass, soaked in water and dissolved in spirit, two ounces (thick); dissolve in this ten grains of very pale gum. ammoniac (in tears,) by rubbing them together; then add six large tears of gum mastic, dissolved in the least possible quantity of rectified spirits.

Isinglass, dissolved in proof spirit, as above, three ounces; bottoms of mastic varnish (thick but clear) one and a half ounces; mix well.

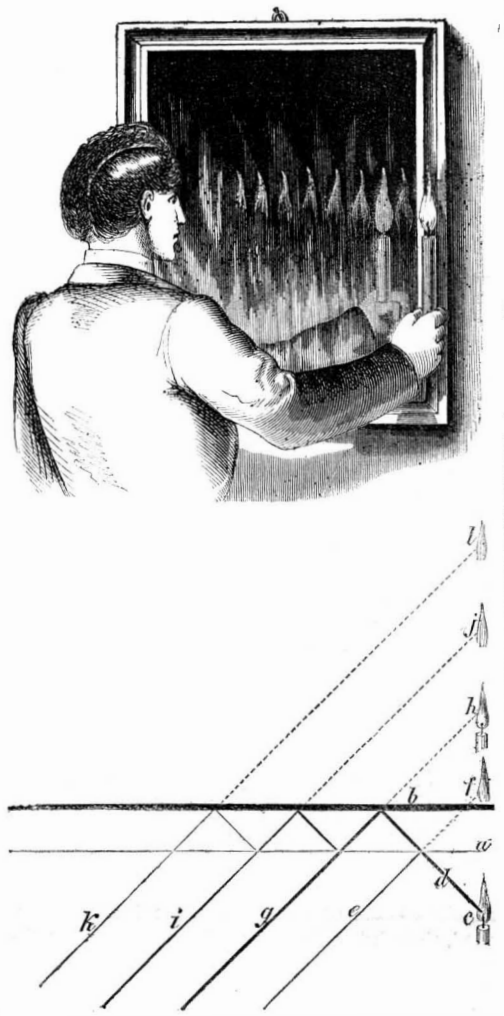
When carefully made, this cement resists moisture, and dries colorless. As usually met with, it is not only of very bad quality, but sold at exhorbitant prices.—[*Tinman's Manual.*

SEEING JUPITER'S MOON'S IN A LOOKING-GLASS.

Having received several communications stating, that by looking at the reflection of the planet Jupiter, in a mirror, his moons could be seen by the side of him, we concluded to try the experiment, and, sure enough, by the side of the planet was a bright speck resembling the appearance of one of the moons as seen through a telescope. We, of course, immediately suspected that this was the reflection of the planet from the front surface of the glass, appearing by the side of the brighter reflection from the amalgam at the back; and, by changing the position of the mirror, this suspicion was fully confirmed, for the "moon" could be shifted at will to different sides of the planet, and even two moons could be made to appear. On looking at the reflection of our moon in the mirror, two moons appeared, one much brighter than the other; this phenomenon resulting from the same action of light as in the case of Jupiter.

This action may be observed by looking, at a sharp angle, at the reflection of any bright object, especially a candle or gas flame, in a mirror. If the mirror be of thick glass, several images of the flame will be seen, the second one always the brightest. The first is formed by the light reflected from the surface of the glass, the second by that reflected from the amalgam at the back, and the third by light which has been reflected twice—once backward from the front surface of the glass till it struck the amalgam, when it was reflected forward from the metal; this action is repeated to form the other images, which, of course, gradually grow fainter from the diminution of light at each reflection.

The accompanying diagram illustrates the subject. *a* is the front surface of the mirror, and *b* the metal sheet at the back; *c* is the candle, and *d* the beam of light issuing from it. As this beam strikes the front surface of the mirror, a portion is reflected in the direction *e;* and if this ray is received by an eye, an image of the lamp will be seen at *f*. The ray reflected by the metallic surface is represented by the line, *g*, and the image of the candle formed by this may be seen at *h*. This image is brighter than the first, in proportion to the larger amount of light reflected from the metal than from the front of the glass.



If the angle is sufficiently acute, as the ray, *g*, emerges from the glass, a portion of it will be reflected inward, against the metal back, and will rebound outward at *i*, forming a third image at *j*, fainter than that at *h*.

As the ray, *i*, emerges, a portion of it will be reflected inward from the surface; rebounding against the metal back, issuing in the direction, *k*, and forming a fourth and still fainter image at *l*. The beam of light will thus continue to be subdivided, forming images more and more faint, until they cease to be visible.

The reflection of light from the surface inward, as it emerges from one transparent medium into another, takes place at an acute angle only; and the requisite acuteness of the angle varies with different media; varying even with different kinds of glass.

Building Ships in New York for the Japanese Navy.

Sometime since the Japanese government appropriated three millions of dollars for the construction of three powerful steam ships of war, and the money was placed in the hands of the American minister, Hon. Robert H. Pruyn, with discretionary power of using it as he thought best. The commission was intrusted to Thurlow Weed and R. P. Lansing, of Albany. Captain J. J. Comstock, assisted by Engineer Jesse Gay, formerly of the navy, has had the general superintendence of construction.

The first of these vessels, the *Fusiyama*, has just sailed for Japan. Her dimensions are as follows:—Two hundred and eight feet long, thirty-four feet beam, fifteen feet depth of hold, and measures one thousand and sixty tuns. Her model is similar to our swiftest clippers, quite sharp forward, with good bearings amidships, and a full round stern. She had two masts, and what is called a full brig rig. She is built of white oak, locust and chestnut, thoroughly strapped and fastened; every bolt and piece of iron in her galvanized. She has five tiers of kelsons and five bilge streaks, the former fourteen by fifteen inches; keel fourteen by twenty inches; garboard streaks six by fourteen inches; planking from four to five inches thick; ceiling four and a half between and five and a half inches thick below deck, varying from nineteen to seventeen inches in thickness—all of solid oak. Her hatchcombings, skylights and other parts, usually of oak, are of mahogany.

The style and finish, the furnishing and fitting up of the Captain's cabin is good enough for the Emperor himself. The style and color of the doors, ornaments, etc., is like that of the Japanese temples. The wood used is our well-known curl maple and black walnut, highly polished and finished. Here, as in every part of the ship, everything is done to conform to Japanese taste as much as possible. The cabin is located in the after part of the ship, is good sized, and contains one bathing and two staterooms; the former being regarded by the Japanese as the greatest of all luxuries. The cabin and staterooms are handsomely furnished and fitted up. The crockery is pure white, with a light gold streak and crimson band round the edge; on each piece is marked the ship's name in Japanese, which resembles the characters on Chinese and their own tea-chests, and other articles of the ship are marked in the same way.

The armament of the *Fusiyama* consists of one 100-pounder and three 30-pounder Parrott rifles, four 9-inch Dahlgrens, and four 24-pounder brass smooth bores—in all twelve guns.

The gun-carriages are of solid mahogany, brass mounted. Great care was taken to use only the best materials; the carriage of the 100-pounder cost $5,000.

She is also well-supplied with the smaller necessaries of war, such as Sharp's rifles, revolvers, cutlasses, etc. Her magazine is of ample dimensions for carrying eight to ten tuns of gunpowder. In addition to the ship's armament, she carries over six artillery field-pieces, gun-carriages and all the equipments, five boats, beside a quantity of shot and shell. Her ground tackle is ample and sufficient, being a double outfit of anchors, chains, cables, etc. Her cost was $500,000.

On the stern and bow are carvings and paintings of Japanese characters. The figure-head is that of a flying dragon. On her stern is a painting of the mountain, Fusiyama, and several smaller mountains. The carvings represent Japanese plants, flowers, birds, the stork, and the tortoise—the former emblematic of purity; the latter, longevity. These last two characters named are the national emblems, to be seen carved and painted on every thing public or private.

On the completion of the *Fusiyama*, last fall, it was the intention of the commissioners to have dispatched her immediately to Japan; but in consequence of the then existing difficulties with some of the treaty powers and that country, our Government detained her until harmony was restored. That having been done, she now departs, with the approbation of the United States Government, for her destined home, there to assume her character, and bear the imperial flag of Japan. She will be commanded by Captain Franklin Hallett, an old, experienced veteran of the China and East India trade.

Her crew will consist of a captain, three mates, one surgeon, one chief engineer and three assistants, one captain of boats, gunner, sailmaker and carpenter. The other two ships will be commenced shortly by the same builders.

Nantucket "Tips."

A correspondent of the *Plymouth Rock* says:—"The Nantucketers have the funniest vehicles one ever laid eyes on. They are called tips; have two wheels, a box some six feet long, and no seats. They will hold some half dozen people, every one standing and holding on to a rope attached to the side of the box. The beach is at least a mile from the hotels, and many of the guests are forced to use this droll conveyance. I can't say much for its comfort, but it has the merit of novelty, and the ladies rather enjoy it. Imagine a string of these vehicles filing down the road, filled with women and children, dressed in the bizarre costume of the sea, innocent of etiquette, oblivious of social distinctions, caring not a fig how they look or how much fun their pedestrian male companions make of them."

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Notes and Queries

P. M., of N. Y.—Astronomers generally attribute the faint illumination of the disk of the new moon to reflection of light from the earth. Why a razor cuts better for being dipped in hot water we do not know. Does it cut better?

J. B. P., of Mass., and J. N., of Wis.—An explanation of the ball and jet similar to yours has already been published.

P. M., of Va.—You will find the catenary curve fully discussed in Davies & Peck's Dictionary of Mathematics, and in most works on geometry.

H. L. W., of Mass.—We think that a limited patent can be had on your reel.

J. H. M., of N. Y.—Your device for making a stream of water run itself up hill, is, like other perpetual motions, impracticable.

W. P. S., of Mass.—A large deposit of a good quality of plumbago, so situated that it could be easily quarried, would be of great value; there is a large demand for it for crucibles, pencils, and other purposes.

G. W. P., of N. Y.—Your law of the relative distances of the planets is beautiful, and it would have spread your fame throughout the civilized world if it had been true, but it is not. According to your diagram the secant of 45° of Mercury's orbit would give the radius of that of Venus. Or, by the 47th proposition of Euclid, twice the square of Mercury's distance from the earth would be equal to the square of that of Venus. The distance of Mercury is 37,000,000 miles, and of Venus 68,000,000; by making the calculations you will see that your law does not hold.

J. G. P., of N. Y.—Henry C. Baird, of No. 406 Walnut street, Philadelphia, will furnish you with a work on plumbing.

T. McD., of N. Y.—Your sketch of a condensing engine without an air pump will appear in a short time. We thank you for your courtesy in sending it. Write again.

J. H., of N. J.—Your inquiry for a spring to drive a fan-blower, to raise 300 pounds of water, (or tuns; we cannot make out which) two feet high, in five hours, is unintelligible. We do not know of any spring that will do this.

J. S. L., of Md.—You must lay your request for a place in the Naval School before the Member of Congress from your district.

H. C. B., of Ohio.—Of two gages, one at the top and the other at the bottom of a boiler under steam, the bottom would show a pressure exceeding the top by the weight of the column of water above. The pressure of the atmosphere is equal to sustaining a column of water 34 feet high, therefore every two feet of water in depth in the boiler would add about one pound to the pressure on the gage.

E. F., of Cal.—We advise a preliminary examination at the Patent Office. There are so many plans for surface condensers that we cannot say whether yours is novel or not.

L. A. J., of Mass.—Smee's Electro-metallurgy is considered a standard work on the subject, though there have been some improvements in batteries since it was published.

R. T., of Pa.—The ports of your cylinder are ample for the bore and stroke.

L. R., of Mass.—The question of belting and power required to drive machines has been fully discussed in this paper. We must refer you to back numbers.

J. H. P., of Texas.—You can buy water rams at any agricultural warehouse; they are manufactured by Thomas Hanson, No. 291 Pearl street, in this city. They are the cheapest and simplest apparatus you can have for raising water. If your supply of water is not abundant we would suggest a windmill for pumping it up.

H. R. G.—No person has a right to use a machine in any county without first obtaining the consent of the owner of the patent for that county. The validity of the patent deeds is not effected unless the same territory has been sold to some one else. Put the deeds on record without delay.

W. J. P.—The *Southern Cultivator* is published at Augusta, Ga.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired

Back Numbers and Volumes of the "Scientific American."

VOLUMES IV., VII., XI. AND XII., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $3 00 per volume, by mail, $3 75 which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding VOLS. I., II., III., V., VI., VIII., IX. and X., are out of print and cannot be supplie

Correspondence

Seasoning Lumber.

MESSRS. EDITORS:—I notice on page 85, current volume, of the SCIENTIFIC AMERICAN, an article, signed "Anthrax," on seasoning of lumber, by which I perceive it to be more and more evident, as I said in a former communication, that the matter of seasoning and drying lumber is very imperfectly understood.

"Anthrax" mentions the Hungarian mode of steaming out the albumen by common escape steam, then plunging the lumber into ice water, and afterward drying it in a close room, which, of course, immediately becomes a steam chamber, provided there is any moisture remaining in the lumber which can be changed into steam.

This placing the lumber in ice water is a regular hocus-pocus, for all the object to be gained by it is to prevent the closing of the pores of the lumber on the outside while going through the farce of changing the lumber from the common steam to the steam drying room. And even in that case common cold, warm or hot water would answer just as well, while it would be far better to leave the lumber in the first steam room, and apply heat to it, so as to preserve a steam atmosphere by steam generated from the drying lumber, which steam excludes the air and prevents closing the pores on the outside until the moisture has passed out of the center.

It seems, however, the Hungarians had the idea that lumber must be seasoned as well as dried; and in that respect they were in advance of many would-be wiser persons, who suppose that drying of lumber is also seasoning it. Lumber may be dried and not seasoned, or seasoned and not dried. It needs both as much as either, for most kinds of uses. To season lumber is to deal with its albumen; if this albumen is soaked, boiled or steamed out, the lumber is seasoned, though the loss of the albumen diminishes its strength and durability, as well as the beauty of finish of all lumber and timber. When all the strength and beauty of the lumber is desired, the albumen should be coagulated and retained in the pores of the lumber.

It is well known to scientific men that when wood dries the sap retires toward the center, carrying with it the albumen, while the aqueous portion is evaporated. This albumen follows the medullary rays to the heart wood, and when once dried and again wetted it swells with an uncontrollable force, which checks or bursts the stock. The starch contained in this sap changes to acetic acid as soon as it comes into contact with water or a moist atmosphere, and eramacaus, or dry rot ensues.

The proper way, therefore, is to coagulate this albumen, so as to make it insoluable in cold water, and still leave the albumen in the pores of the lumber, where it belongs, and where its presence is as valuable as paint for its preservation, or as pumice stone or shellac to make a smooth or finished surface.

It is evident that "Anthrax" has a very imperfect idea of the American patent mode, as he calls it, for seasoning and drying by superheated steam. He seems to confound superheated steam made under high pressure, requiring strong and expensive boilers—the use of which, he says, is one of "great delicacy," with the new mode, by means of which a much higher degree of heat may be obtained than would be practical or safe when made under pressure; and yet the new mode requires no greater pressure than will just balance the pressure of the atmosphere, requiring no expensive apparatus; no safety valves, and not even a steam boiler, and with the whole apparatus and its management so simple that any boy that can build a fire and read the thermometer can work it perfectly. Besides, where steam is superheated in particles, as in the new mode, the heat can be applied so as to obtain any kind of an atmosphere desired, from 100 to 1,000 degrees or more. In fact, this kind of steam is now used to melt iron, and excels all other modes for that purpose, both in economy and in the quality of the iron produced.

By the new mode of seasoning and drying I placed 9,000 green gun stocks in a kiln say 16 by 24 feet, at one of the large armories, and then took six of the stocks as samples of the remainder, and gaged each stock into $\frac{1}{64}$th of an inch, and weighed them in pounds and ounces. Each 24 hours, or day, these stocks were separated, re-weighed and gaged, to ascertain the daily progress in drying and shrinking. If necessary, I can furnish the weight and gage of each stock, but will at present give the result of the six stocks combined, to wit: The first 24 hours they lost in weight 12 pounds and 13 ounces, or 2 pounds and $2\frac{3}{6}$ ounces each, which, if applied to the whole 9,000 in the kiln, would show over 19,000 pounds of water removed during the first 24 hours. The second 24 hours the six stocks lost 5 pounds, 5 ounces; and, by continuing the fire 12 hours longer, they lost 2 pounds, 13 ounces.

During the first 24 hours the combined gage of the six stocks was diminished $\frac{2}{6}\frac{3}{4}$th of an inch; second 24 hours, $\frac{9}{64}$th of an inch; last 12 hours, none; thus showing that by this process the shrinking is all completed before the drying is all done, while the seasoning and drying occupied only $2\frac{1}{2}$ days.

There is no necessity for drying any lumber after the shrinking is all completed. It is worthy of note, however, that in the finishing of these stocks it was ascertained that the usual wetting of the stock after the first finishing did not raise any grain on the wood thus showing that the seasoning, as well as the shrinking, was performed in the same kiln in $2\frac{1}{2}$ days, while the albumen was so thoroughly coagulated as to become practically insoluble in cold water.

I have extracted at the rate of over 1,900 pounds of water from 1,000 feet of green lumber, as a part of a large kiln, in four days.

H. G. BULKLEY.

Cleveland, Ohio, Aug. 17, 1865.

Castor Oil as a Lubricator.

MESSRS. EDITORS:—On page 83, of your paper, you say nothing can be worse for machinery than castor oil, as it gums badly, etc. I never used it myself, so I cannot speak from personal knowledge, but three or four months ago a Santa Fe trader, who had crossed the plains "twenty times" with trains of wagons, assured me that he found castor oil to be the best lubricator he had ever tried for wagon axles. On a bystander remarking that he thought it would be too dear a material for this use, the freighter answered, that it lasted so long without thickening, and so little was required, that it was the cheapest in the long run. "I only oiled three times between Santa Fe and Leavenworth, and my axles were as cool and clean the last day as the first." This was his testimony. I use lard oil for machinery and patent grease for wagon axles.

By the way, why don't the inventors get up a convenient way of oiling wagon and coach axles so as to relieve us of the necessity of "jacking up" heavy vehicles? Why not have oil cups back of the hubs leading down on to the axle? I have tried perforations through the hubs and axle boxes, but the centrifugal force defeated me. The oil reservoir must be stationary, and not revolve, and be some distance above the axle. It is true that farmers are not prone to lubricate sufficiently. They are usually careless of machinery. EDWARD M. RICHARDS.

Mound City, Kansas, August 20, 1865.

A Question of Pressure.

MESSRS. EDITORS:—If 30 lbs. of steam is all that is required to run an engine comfortably, is it a waste of fuel to carry 50 lbs? It seems to take more water to carry 50 lbs. of steam than 30 when there is only the same amount of steam used. L. J. L.

Sandwich, Ill., Aug. 31, 1865.

[It takes twice as much water to make a quart of steam at 60 lbs. pressure that it does to make the same volume at 30 lbs., therefore there would be a waste of fuel in using a given volume of steam at 50 lbs. pressure instead of 30 lbs. But if your boiler will bear 50 lbs. with perfect safety, you would probably find it economical to work your steam at that pressure, cutting off short enough to get only the power that you need. From the great mass of experiment and discussion in regard to working steam with different measures of expansion, the one truth that seems to be emerging is, that it is economical to use steam at high pressure.—EDS.

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A Suggestion in Raising the Cable.

MESSRS. EDITORS:—Those engaged in laying the Atlantic telegraph cable, after being so fortunate as to grapple the broken line three times, lost the fruit of their labors on account of the very circumstance upon which, a few days before, they were congratulating themselves, viz., the very small amount of slack run out. This only amounted to 14 per cent. In every 14 miles run there would be 16 miles of rope —2 miles of slack. If it could be brought to the surface in water 2½ miles deep, at a single lift, there would be about 13 miles of cable hanging by a single point—about 6½ miles on either side. If I remember correctly, the cable was only calculated to sustain 11 miles of its own length in water, so that there would be 2 miles to be lifted beyond the capacity of the cable. Besides, the slack, being pretty evenly distributed over the 12 or 13 miles, part of the cable would have to be dragged on bottom to make it available. It would seem, then, that neither the cable nor the grappling ropes could stand the strain that would be put upon them.

I think that the operation of raising would be far more likely to be successful if made thus:—Suppose the cable grappled at joint, B, and raised only half way to the surface, and made fast to a buoy; then grapple cable again, about 10 miles off, at point, C, raising, as at B, and attaching a buoy; then by grappling at A, between the points, the cable would be brought to the surface with very little strain compared with the strain of raising it at one lift.

This is a mere speculation, the truth of which the next news from Europe may or may not confirm. It would be presumptuous, to say the least, for any one to affirm positively that it cannot be brought to the surface at one lift—but it does not seem probable; however, if any one, ten days ago, had said that the lost cable could be successfully grappled for in water 2½ miles deep he would have been considered very visionary. CABLE.

Philadelphia, Aug. 19, 1865.

A Question of Levers.

MESSRS. EDITORS:—We have a question under discussion here relative to two levers, namely, which of the two levers will raise the greatest weight with the same power? The first lever is three feet long; the fulcrum is at the end of the lever, and the weight one foot from the fulcrum. The other is the same length, and the weight is at the end of the lever, the fulcrum one foot from the weight. I contend there is a difference. O. CARMAN.

Union, Ill., Aug. 29, 1865.

[In both levers the short arm is one foot in length, but the long arm of the lever which has its fulcrum at the end, is four feet in length, while the long arm of the other is only three feet, consequently three pounds applied to the former will raise as much as four pounds applied to the latter.—EDS.

Croton Bugs and Cockroaches.

MESSRS. EDITORS:—Each returning summer finds these pests on the increase, and they seem to laugh at "pyrethreum" or other poisons. Allow me to state in your paper this fact, which is but little known, viz., powdered borax sprinkled liberally where they most do inhabit is a dead shot on them. I account for it in this wise, that the borate of soda being a sweet alkali is, like St. John's little book, "sweet to the mouth and bitter to the belly."

ALEX. SHELDON, Chemist.

Buffalo, Aug. 28, 1865.

Origin of Petroleum.

MESSRS. EDITORS:—Soon after the petroleum discovery in Pennsylvania, I suggested that, instead of this product having its origin from coal, the reverse was the more probable process; more in accordance with the usual operations of nature, which generally adopt the simplest and most direct means for obtaining a given result, and not, as has been taught in this case, the most roundabout way that could be conceived of.

Suppose, and it is not an unreasonable supposition, that down in the subterranean caverns of the earth, the salt water should come in contact with beds of graphite or carbonized iron. By the operation of double elective affinity, the oxygen of the water might combine with the iron, and the hydrogen with the carbon, the latter combination forming the carbureted hydrogen gases, which, by the immediate pressure of constantly-forming gas, would be condensed in underground caverns as oil. This is a straight-forward and simple process, and is, to say the least, feasible. We are not very well acquainted with the internal chemistry of the earth, but we have occasionally pretty strong evidence of its activity. The sudden production of a large quantity of this gas might account for earthquakes.

Whether coal could be derived from petroleum would require more investigation than I have given to the subject. W. F. QUINBY.

Wilmington, Del., Aug. 27, 1865.

[It is generally considered more probable that neither coal nor petroleum was produced from the other, but that both are the products of organic decomposition, the difference in the results being due to the different conditions under which the decomposition took place.—EDS.

THE DISASTER TO THE CABLE.

On the 2nd of August the cable parted and went overboard in nearly 2,000 fathoms water, 1,062 miles from Valentia. The cause of this sad accident arose from the discovery of a fault and consequent hauling in of the cable, and the very imperfect engine used for the purpose. Who would have supposed that an engine specially provided to perform that very important work would be in such a disgraceful state? "Eccentric gear out of order, so that a man had to stand by with a handspike, aided by a wedge of wood, and an elastic band to aid the wretched engine. Next the supply of steam failed, and when the steam was got up it was found that there was not water enough in the boilers, and so the picking-up ceased altogether for some time, during which the ship forged ahead, and chafed against the cable. Then occurred the great misfortune." Of course it did; it would require a most wonderful cable to withstand such playing with in 2,000 fathoms water with one end held to the bow of a vessel that was continually rising and falling and chafing against it. We wonder it did not part sooner and fly overboard. Whatever distance the bow of the *Great Eastern* rose and fell when the cable was fixed at the bow, and not being hauled in, that same length was allowed for by the cable stretching, for it was impossible that it could be absolutely lifted, in the time of the rise, from the bottom, or for a length of 2,000 fathoms. We almost question if the strain was felt at the distance of 1,000 fathoms, for the friction of 1,000 fathoms of cable in water, when moved with the same speed as the rise of the bow of the vessel, would be enormous.

It is almost certain that the main "faults" were caused by the stretching of the spiral spring, and consequent opening of insulating material and disruption of the copper core. Hauling-in ought never to be required, for it is a most dangerous operation with any cable in great depth of water, and where the surface is not as smooth as a mill pond. Such hauling-in would not have been required had the cable been made with the sustaining wires parallel with the axis, and therefore parallel with the copper core; then the copper wire, being the most ductile, would always have accommodated itself to the extension from strain of the iron covering wires; they, being straight and of iron, would naturally break before the copper core could be injured in the slightest degree. Thin wires wound round the straight sustaining wires would bind them together on the insulating material as perfectly as could be desired. The arrangement for hauling in from the bows of the vessel was a great mistake. What an amount of hazard and care would have been avoided had the hauling-in apparatus been fixed at the stern—either by itself and parallel to the paying-out machinery, so that the cable would simply have required lifting out of the groove of one wheel into the other, or, as Captain Anderson recommends, having an engine applied to the paying-out gear so as to reverse and haul in at once, while the fault was being located. Such an arrangement would have greatly reduced the risk of completely losing the cable—not, however, with such a faulty engine as was used at the bow of the vessel.

As to fishing up the cable from a depth of two miles and a half, or two miles of water, the chances are very vague. If in a distance of nine hundred and forty-eight miles only one thousand and eighty-one miles of cable were payed out, there is not much slack left for the successful picking up. Presuming that the cable was laid hold of at the depth of 2,000 fathoms, and presuming the fishing tackle to be amply strong for any strain—what would be the consequence to the cable? Why, it would break long before it was brought to the surface. When it is considered that it is laid in nearly a straight line, there being so little slack, the strain on itself from its own weight would be very great when lifted only one mile from its present resting place. Assuming that in the length of about four miles of cable the length of slack is half a mile, the center of four miles and a half being lifted up one mile, the strain on the cable at the highest point would be equal to three miles of its own weight on either side of the fishing tackle; beyond this strain, there is the strain due to the friction of pulling it through the water. If it is strong enough to withstand the above strains, how much higher could it be lifted? In lifting it higher the cable must either stretch, or be dragged along the bottom of the ocean beyond the distance of two miles on either side. Even supposing the curve of the catenary to be flatter than we have assumed, the consequence would be a proportionately increased strain on itself at its highest point, due to an increased length suspended at a more acute angle with the horizon. It thus appears impossible to lift the cable safely out of this great depth of water—especially when we consider that experiments have been made which gave a result showing that, in great depth of water, the strain with equal velocity is increased to four times when the length is doubled; and, in addition to this, it must be remembered that the friction is increased as the square of the velocity.

Our only hope of regaining a portion of the cable is by fishing it up in shallow water, and carefully, and slowly, underrunning it in very calm weather. No doubt there are many enterprising men who would undertake to underrun it at a certain sum per mile, and it might be to the interest of the company to accept any reasonable offer to that effect. We regret, however, that nothing more can be done towards picking it up and completing it this year. Early next year we hope to see this cable underrun for a considerable distance, a connection safely made, and a complete cable in perfect working order, resting on the bed of the wide Atlantic. It may be advisable at the same time to lay another cable of such specific gravity that it would slowly sink to the bottom of the ocean. Such a cable would have but little strength, and must therefore be of such a quality that it would by no chance whatever require hauling in. It will be a proud day for Englishmen when this important work is successfully completed.—*Mechanics' Magazine.*

Sheathing Iron Ships.

Among the numerous plans for rendering the bottoms of iron ships proof against fouling, is one by Mr. Mulley, Lloyd's surveyor at Plymouth. It consists in completely incasing the ship's bottom with wood to a considerable hight above the deep load-line, and then covering the wood with a sheathing of yellow metal in the same way as the bottom of a wood ship is sheathed. This method of treatment he applied to the *Iron Gem*, which is now in the Clarence Graving Dock for inspection, she having just returned from a voyage to the Brazils. The outer metal sheathing is smooth and clean, not exhibiting even a wrinkle, while, by the ingenious yet simple mode in which the wood casing is secured to the hull, no metallic contact is possible between the iron of the ship and the yellow metal or any of its fastenings, and by this arrangement galvanic action is completely prevented.—*Mechanics' Magazine.*

[Wet wood is too good a conductor of electricity for this plan to work.—EDS. SCI. AM.

WE know that the attraction of the whole earth gives to a body near its surface a velocity of 32 feet in a second, and by comparing the masses and distances from the center of the earth, and a globe of the same density and a foot in diameter, we can easily calculate the velocity the latter would give a small body near its surface. The velocity thus determined is less than an inch in a year.

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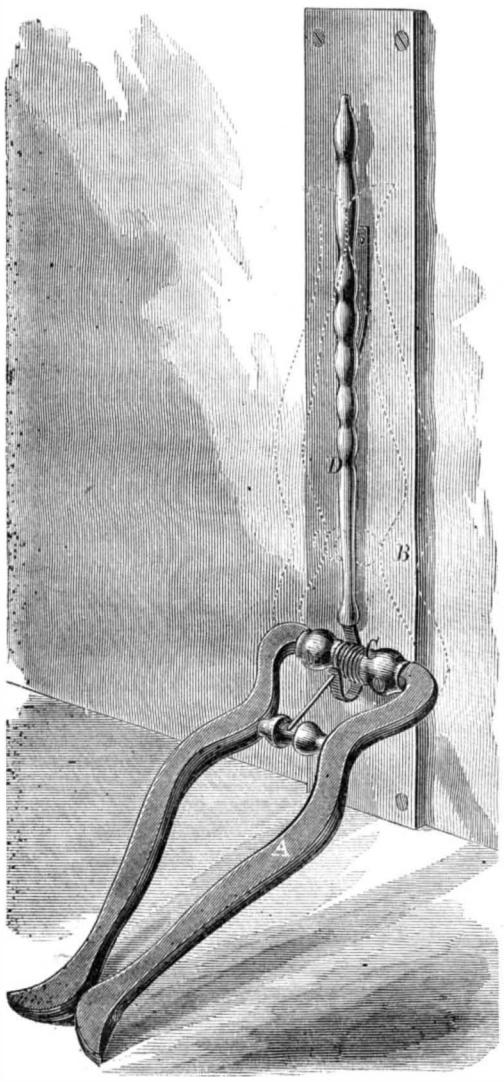
RICHARDSON'S BOOT-JACK.

We have read, in some recent publication, of the highly reprehensible conduct of an individual who, on slight provocation, threw a boot-jack at his servant. This occurred partly because the individual was demoralized, and partly because the boot-jack was lying around convenient; but had it been properly constructed it would never have been the terror of a guilty party or the innocent instrument of wrath.

This boot-jack cannot be thrown at people's heads—it cannot be lost, estrayed or stolen; if it is, the thief must take the wall of the house too, for it is fast thereon.

This boot-jack is designed to remedy the inconveniences which are common to the old one, such as being mislaid, and not to be had at the proper time.

It is fastened to the board, A, which in turn is screwed to the wall of the room where the boots are drawn off—as the kitchen or bed-room. In construction it is simply a jack, A, hinged to the board, B, and fitted with a spring, C, which holds it upright when not in use, as shown by the dotted lines. At D there is a handle with a leather strap; by lifting this when the jack is up against the wall, the jack will be let down, as in the engraving, all ready for use. It is not in the way, and is a convenient thing. It was patented June 19, 1864, by M. A. Richardson.



For further information address Richardson's Patent Boot-jack Co., Sherman, Chatauqua County, N. Y.

EYE SERVICE.

There is nothing more humiliating to a right-minded person than to be watched. There is nothing more annoying to an employer than the spectacle of men hard at work in his presence, but idle, or dilatory so soon as his back is turned. A man who is desirous of earning his wages works at all times during business hours, but one whose chief anxiety is to draw his salary, is better out of the way than in it, and is, moreover, dishonest.

Whether the engagement be for one year or one week, the agreement, on the one hand, is to pay a certain sum for the services of an individual; on the other, to work faithfully and honorably for the said term. What would be thought of the employer who should, on pay-day, withhold a portion of the salary by reason of the contract not being kept by the workman. He would be universally condemned as mean beyond precedent, but is there any more justice or honor in frittering away an employer's time, or deceiving him by a pretended performance of work, than in witholding an employee's salary? None at all. Labor is honorable, and the man who works for his living, whether with a pen or a hammer and chisel, is to be respected, but no one respects a man who is constantly trying to evade his duty, and if he is held in low esteem, he alone is responsible therefor.

French Mode of Making Butter.

A prompt and easy means to manufacture butter is to put the cream into a sack of linen, neither too thin nor too thick; tie the sack and place it in a hole in the ground fifteen to twenty inches in depth; cover the hole, and leave the cream for twenty-five hours; take out the cream, which is very hard, and pound it with a wooden pestle to separate the butter; pour on a half glass of water and the butter separates from the butter-milk. It is an affair of two minutes.

If the cream is in large quantity it is necessary to leave it more than twenty-five hours. In winter, when the earth is frozen, the operation may be made in a cellar with sand. This process never fails. In Normandy and Berry, butter is made in no other way, for not only is loss of time avoided, but the cream yields a larger per cent, and the butter is excellent.

Some persons inclose the sack of cream in another sack to avoid putting the earth too nearly in contact with the butter.—*La Science Pour Tous.*

[We translate this from our cotemporary as a matter of curiosity, and if any of our readers try the plan, we should like to hear the result. Cream is so extremely sensitive to all odors and flavors, we should suppose that if buried in the ground it would be very certain to contract an earthy taste.—Eds. Sci. Am.

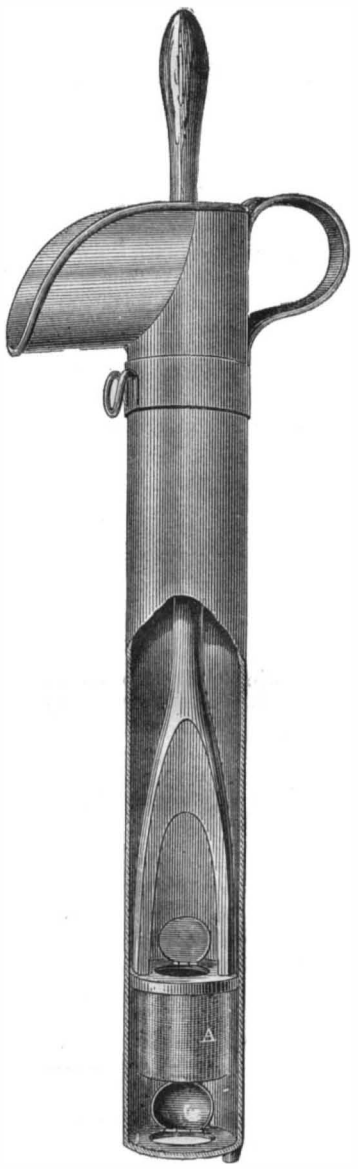
How Silver is Extracted from Quartz.

A correspondent of the Boston *Advertiser*, writing from Virginia City, Nevada Territory, gives the following interesting account of silver mining:

"After the quartz has been extracted from the mine, it is taken to the mill, broken in pieces of from half a pound to two pounds in weight, thoroughly dried by the application of heat, and then crushed to powder in the mill. Various machines are advertised for crushing quartz, which their inventors and proprietors say will accomplish great results, but none of them are yet in practice and successful use at Reese River. The process universally resorted to in Nevada is the old stamp mill. This process is simply the dropping of heavy weights upon the quartz, which is placed in dies prepared to receive it. Five stamps are usually arrayed side by side, weighing from five hundred to seven hundred pounds each They are raised a distance of from eight to ten inches, and dropped from sixty to eighty-five times a minute. A wire seive is placed upon each side of the dies, through which the powdered quartz escapes into a receiver, from which it is taken to a furnace, where it is subject to the action of a stream of flame from five to eight hours, during which time it is constantly stirred. As this flame carries off some silver bodily, it is made to pass through a long chamber, and exposed to cooler air before reaching the chimney, so that the silver can be saved. After being roasted, the pulverized quartz is ready for amalgamation. At the Midas Mills, which is considered to be the best mill at Reese River, the amalgamation is done by the Frieburg barrels, into which loose and irregular pieces of iron are placed for the purpose of mixing the quicksilver with the pulp (as the pulverized quartz is called), and which are then revolved over and over. In other mills, the pulp is put into tubs, and stirred in water for nearly an hour, and then the quicksilver is applied, and the mass is stirred by means of iron flanges for three hours. About seventy-five pounds of quicksilver are allowed for one thousand pounds of pulp. After this the water is drawn off, and a process like the distillation of cider brandy is resorted to for the purpose of saving the quicksilver, and the amalgam, composed of silver and quicksilver, is squeezed to get out the quicksilver, after which it is put in the retort, and upon being subjected to heat, more quicksilver passes off in fumes, and is saved, and the crude bullion which is left is ready to be taken to the assay office. This is substantially the process used at Reese River, where dry crushing is necessary, on acconnt of the presence of baser metals. In Virginia and vicinity, where the ore is of a different character, and far less rich, it is crushed wet, and the expense is much less."

RICHARDSON'S CREAM PUMP.

It is well known to butter makers that cream kept for a few days loses a portion of its water and becomes curded when exposed to the air. If churned in this condition the butter resulting will be poor in quality and full of fragments of the curds which have not been reduced; these not only render the butter unsightly, but greatly depreciates its quality.



This pump is intended to divide and subdivide every particle of curd thus formed, and to render the whole as smooth as if just skimmed from the milk. In construction it is an ordinary pump, furnished with a bucket and valves, as usual. The lower part of the bucket, however, is surrounded with a gauze strainer, A, through which the cream must pass before it can get out. It is on passing through this strainer that the cream is reduced as specified and rendered fit to churn immediately. It is also easily cleaned, and not cumbrous to use. The patent was reissued through the Scientific American Patent Agency, March 17, 1863. For further information address Richardson & Keeler, Sherman, N. Y.

Colors on India-rubber.—The *Druggists' Circular* says:—"The surface of the object is covered over with a thick solution of caoutchouc in turpentine rubbed up with white zinc, and when this is thoroughly dried, the color which it is desired to apply is put on mixed with turpentine.

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TROUBLES INCIDENT TO STEAM BOILERS.

"I don't see what is the matter with my boiler," said a friend recently, "it used to make steam enough, but now it is all I can do to run the engine through the day." Upon having an examination, the mystery was found to consist of ashes in the smoke box and soot in the tubes; simple enough, certainly. The cure was, a shovel and half an hour's labor.

We receive frequently elaborate descriptions of boilers and engines by mail, giving full dimensions of each, with statements of the length of time they have run together, with a request to state (generally by return mail) the cause of their decay and general failure after years of service.

Many people have an idea, apparently, that a steam engine loses some portion of its vitality every year in some unknown way, so that its decline and fall is simply a question of time. This is true where no care is taken of machinery, but, with intelligent supervision, and repairs when needed, a steam engine one hundred years old will be as good as the first day it took steam. It is as unreasonable to expect a steam engine to run continually without repair and inspection, as for a human being to exist without eating. A little reflection would show that if a steam engine has run for a term of years, doing the same work continually, the failure, if there be any, arises from natural causes, and that examination of it by a competent person would be the course to adopt.

It often happens that shafting gets out of line in a shop, and that the machines generally are disordered in their relation with the power which drives them. Where this is the case, lining up the shafting and setting up the machines again would effect a great saving of power and fuel. It also happens that boilers sometimes give out, or cease to make steam freely, from the destruction of the draught.

If one building be erected by the side of another the draught of the chimney will be affected when the wind is in a certain direction, and this in spite of the general cleanliness and good condition of the boiler. The remedy for this is to increase the hight of the chimney or put in artificial draught.

It is also frequently the case where pine wood or bituminous coal is used for fuel that a resinous deposit forms on the inside of the tubes, to the very great detriment of the steaming qualities of the boilers. It is extremely difficult to remove this, as it is composed of soot and resin, and adheres to the iron with great tenacity. A whalebone brush is sometimes employed; also a brush made of steel wire, but these instruments merely scratch the surface of the deposit without removing it. It has occurred to us that a strong, hot solution of potash might be used with good effect in this case, and we recommend a trial of it at least. It cannot hurt the boiler externally, and is so easily tried that it should be.

Another acquaintance, some time since, called our attention to his boiler and engine, the boiler failing to make steam sufficiently, although in size it was ample. The defect here was in the setting. The boiler, an ordinary cylinder, was set on top of two brick walls, as the cover would be laid on a box, and the fire-place was simply a gaping cavern, in the further end of which the throat of the chimney loomed wide and voracious. If all the heat of Vesuvius in eruption were turned under the boiler it would hardly make steam enough in its condition. The steam would have been made in the chimney, for that was where the heat went, and its effect on the boiler seemed more like a passing favor than any actual duty it was bound to perform. When the furnace doors were opened a roaring wind passed through them, and the blaze went far up the chimney. The remedy in this case was to lessen or obstruct the draught; to add a bridge wall five or six feet from the furnace door, and to put a damper in the chimney, so as to arrest the heat when desired.

But lately we received a letter from a party desiring to be informed what size engine a boiler of certain dimensions would drive. He added, on closing, "If the boiler is not large enough it can be lengthened." Not large enough for what? the engine it would drive? This seems like a hasty inquiry.

As has been recently pointed out, the field for improvement is very wide. The proportion of heat utilized to that driven off or lost is very little—hardly one-tenth—and this waste is going on continually. Of course the quantity differs in different boilers, and can be greatly lessened by good management, but that great slovenliness in the use of fuel, and great indifference prevails on the part of proprietors toward getting competent engineers to attend their boilers, is apparent to any intelligent observer.

THE CORN SUGAR PATENTS.

The patents granted to Frederick W. Goessling and his assigns for a process of making sugar from corn and beet roots, are at last issued, and copies may now be obtained by parties desiring them. The unprecedented price for which these patents were sold, and the quantity of matter that has been published in relation to them, has created a wide interest in them; the following brief statement, therefore, of their leading features will doubtless be acceptable to many of our readers:—

On the 10th of May, 1864, two patents were issued, one for a process of making sugar from corn and beet roots, and the other for the sugar thus produced as a new article of manufacture. The specifications describe, first, a process of washing the starch out of corn, then a process of converting this starch into grape sugar. It is the well-known process of steeping the starch in very dilute sulphuric acid, with some slight modifications, one being the introduction of "the extract of potato eyes." Then a process is described of extracting sugar from beet roots. Before granulating the two sirups are mixed together, and after the mixture the sugar is granulated and drained.

It will be seen that the most important feature is the mixture of the two kinds of sugar—the grape sugar, made from starch, and the cane sugar, extracted from the beet root—this mixture being made before the granulation. What virtue there may be in "the extract of potato eyes," and in the other modifications of the modes at present employed for converting starch into sugar, we do not know.

On the 20th of December, 1864, a third patent was granted for a compound sugar made by mixing the sirups of cane sugar and grape sugar, by whatever process these sirups might be produced.

It has been stated, positively and repeatedly, by men of the highest respectability, that the sum of six hundred thousand dollars in cash was paid for these patents; it is certain that the parties alleged to have made the purchase are abundantly able to pay this enormous sum.

CLOSE WEATHER.

During the first days of September the heat has been more oppressive than in any part of the summer, though the temperature, as indicated by the thermometer, has not been as high, by several degrees, as in the warmest of the summer days. Why should there be at different times this difference in the relative effect of heat upon the expansion of mercury, and upon the sensations of the human system? The answer is, doubtless, to be found in the different hygrometric conditions of the atmosphere.

The temperature of the body is prevented from rising above 98° by evaporation. The heat of the system is generated by the slow oxidation—in other words, by the slow burning of the food, and, when it is generated too rapidly, the glands, by some mysterious action, are stimulated to secrete perspiration, which, as it comes to the surface, is evaporated, absorbing and rendering latent 1,000° of heat in the operation, and thus keeping the body cool. When the air is already saturated with moisture, the evaporation is obstructed, and hence the feeling of oppression.

Could the property of matter by which the glands are made to increase their action at 98° be discovered, it might be of great value in the chemical laboratory, and in many of the arts. The power of maintaining a constant temperature of 212° by the boiling of water, is now in daily use in all households, and the power of maintaining without variation a far lower temperature, might be of equally extensive application. It is probable, however, that this property belongs to matter only when organized in animal systems, and will, therefore, never be available to human art.

A HEAVY LOCOMOTIVE.

The Jersey City Locomotive Works have recently completed a very heavy engine for the Atlantic and Great Western Railway.

This engine has some points of novelty in the general arrangement of the details, but the great weight of the machine, and the size of the cylinders, strike every one immediately.

The weight of the engine is 42 tuns, of which 13,800 is on the two small wheels forward, and the remainder on the three pair of driving wheels. The wheels are four feet in diameter, and have Krupp's steel tires. The cylinders are 18 inches diameter by 24 inches stroke, and the steam ports to the same are 1 inch by 14 inches. The exhaust is $2\frac{1}{2}$ by 14.

The drivers are connected, and have flanges on the tires, and the cross-head works on guides, above the piston rod. The guides consist of two steel bars, about $2\frac{1}{2}$ inches square, and the cross-head has a bearing of nearly 20 inches on them. There are brass gibs fitted to the cross-head, but the wear of them is a source of trouble. The boiler has 180 iron tubes, about 12 feet long, and burns soft coal.

The tender weighs twenty tuns, with coal and water. The water capacity is 2,000 gallons, and the coal 6,000 pounds. With this amount of fuel we are assured that the engine can run one division of the Erie Railroad, which, we believe, is 120 miles.

This engine is a fine piece of work, and does credit to the establishment where it was built. Twenty-six of the same pattern have been constructed for different roads. We are indebted to Mr. J. J. Barton, engineer of the Atlantic and Great Western Railroad, for these particulars.

Fair of the American Institute.

We remind our readers that the great fair of the American Institute opens on the 12th of September. Unusual efforts have been made to have this the most extensive and interesting exhibition that the Institute has ever had. It is said that the display of moving machinery will be especially attractive, and will embrace a number of novelties. Full reports of the exhibition will be published in the SCIENTIFIC AMERICAN.

THE CHICAGO TUNNEL.—The distance now reached in the Chicago lake tunnel for the water-works is 3,500 feet, and the work is progressing at the rate of 17 feet a day; the authorities confidently expect a completion of this gigantic labor of tunneling the lake for two miles, and the accompanying works, by the close of next year. The city has over 129 miles of water pipe laid and in operation. The income from the water rates for the last fiscal year was $224,902.

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ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING SEPTEMBER 5, 1865.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

49,690.—Machine for Drawing Spikes.—Nathan Adams, Altoona, Pa.:

I claim the sliding stock, D, operated by the eccentric, E, and lever, F, or their equivalents, in connection with the jaws or nippers, C C, pivoted to the eye, b, on the guide rod, H, of the stock, all arranged to operate in the manner substantially as and for the purpose set forth.

[This invention relates to a new and improved device for drawing spikes, more especially designed for drawing railroad spikes, and it consists in the employment or use of a sliding stock, in connection with jaws or nippers and a lever, all arranged in such a manner that the desired work may be performed expeditiously and without bending or injuring the spikes, so that the latter may be again used.]

49,691.—Machinery for Plating or Finishing Sheets of Paper.—Charles T. Bainbridge, Brooklyn, N. Y.:

First, I claim the flexible plates, i i', applied and operating in combination with a pair of pressure rollers, substantially as and for the purpose herein specified.

Second, The weights, E F F', attached to the ends of the flexible plates, i i', and operating substantially as and for the purpose herein specified.

Third, The combination of the flexible plates, i i', pressure rollers, B B', weights, E F F', feed board, n, and delivery board, p, the whole arranged and operating substantially as and for the purpose herein specified.

49,692.—Sawing Machine.—N. B. Baldwin, Georgetown, Ill.:

I claim the combination of the guide rods, J J', and springs, L L, with the saw, K, and frame, D, as and for the purposes specified.

[This invention relates to a new and improved sawing machine for sawing wood transversely with the grain, and is designed for sawing logs into proper lengths for cord or fire wood, and also into proper lengths for re-sawing into lumber. The invention consists in a novel construction and arrangement of the saw frame, and in the application of springs to the saw for feeding the latter to its work.]

49,693.—Road-making Device.—Thomas T. Barber, Hampton, Conn.:

I claim the combination of the two gangs of plows and the draft gear with the scrapers, when the whole is constructed and fitted for use substantially as herein described and set forth.

Second, I claim the combination of the scrapers with the harrow, when both are constructed, connected and fitted to produce the result of scraping and leveling, substantially as herein described and set forth.

49,694.—Evaporating Pan.—H. F. Bartlett, La Grange, Mo.:

First, I claim the pan provided with flaring or inclined flanges, a, around the vertical sides, and with terraced bottom and partitions, arranged substantially as and for the purpose herein set forth.

Second, The side or scum chambers, E, the bottoms of which are a little higher than that of the pan communicating with any or all of the compartments of the same, substantially as and for the purpose specified.

Third, The transverse air tubes, F, placed in the upper part of the furnace underneath the pan, immediately in front of the sloping portions of the bottom, as and for the purpose specified.

[This invention relates to certain improvements in a sugar pan, which Letters Patent were granted to this inventor, bearing date Oct. 18, 1864. The invention consists in a modification of the construction of the pan, whereby the juice is prevented from boiling over; and also in the employment or use of a skimming chamber applied to any or all of the compartments of the pan, and in the application of air tubes and plates, to prevent the burning or scorching of the juice.]

49,695.—Railroad Car.—A. Ely Beach, Stratford, Conn.:

I claim the employment of a cable-seizing device, constructed and operating substantially as herein shown and described.

49,696.—Draft Cable for Railroad.—A. Ely Beach, Stratford, Conn.:

First, I claim the construction of the links of a draft cable, substantially as herein described.

I also claim the combination of the friction wheels with said links, substantially as herein described.

I also claim the serrated comb or back, constructed and employed as herein set forth.

I also claim the combination with a draft cable of a scraper, substantially as described.

49,697.—Sliding Draft Cable for Railroad.—A. Ely Beach, Stratford, Conn.:

First, I claim the combination of a cable and a supporting surface, substantially as described, so that the rubbing surfaces will be protected by the cable.

Second, I claim the suspension of draft cables upon sliding ears or bars, substantially as described.

Third, I claim the combination of the supporting frames with the cable, substantially as described.

Fourth, I claim the construction of the wall or walls of the groove or channel in which the cable runs, with grooves and bearings to receive and support the cable or the case thereof, substantially as described.

49,698.—Track for Railroad.—A. Ely Beach, Stratford, Conn.:

I claim the construction of tracks for railroads and draft cables, or for draft cables only, substantially as herein shown and described.

49,699.—Mode of Transmitting and Delivering Letters, Packages, Etc.—A. Ely Beach, Stratford, Conn.:

I claim the employment of an endless chain or belt of troughs, pouches, conveyors or receptacles, moving through tubes or channels, constructed and operating substantially as described, for the transportation and delivery of letters, packages and all kinds of freight.

49,700.—Instrument for Throwing Dice.—Benjamin F. Bee, Harwich, Mass.:

I claim the perforated disk, A, and wires, a d, the same being combined and operated substantially as set forth.

49,701.—Table and Bedstead Combined.—J. R. Bennett and P. W. Birck, Brooklyn, N. Y.:

I claim the slatted frames, H H, table top composed of the two parts, D D, connected by end pieces, E E, which are provided with deviating projections, b, to work in dovetail grooves, a, in the upper edges of the bars, B, of the table frame, substantially as herein shown and described.

[This invention consists in a new and useful combination of a bedstead and table, whereby the device may, with the greatest facility, be adjusted so as to serve either as a table or a bedstead, and answer as well in either capacity as if made separately for each.]

49,702.—Metallic Collar.—Louis Billon, Brooklyn, N. Y.:

I claim a collar adapted for attachment to the shirt buttons by means of the auxiliary-bifurcated piece, A, substantially as shown and described.

49,703.—Metallic Shirt Bosom.—Louis Billon, Brooklyn, N. Y.:

I claim, as an article of manufacture, a flexible enameled shirt bosom, made up of detachable sections, easily separated and held together, in the manner described, having longitudinal corrugations, the whole constructed and operating substantially as described and for the purpose set forth.

49,704.—Oil Drill.—L. H. Bowman, Norristown, Pa.:

I claim, First, Forming a supplementary chamber, J, within the walls of a tubular drill rod, for receiving the detritus of the rock and other heavy matter from the chamber next above the valve, substantially as described.

Second, I also claim the combination of the central tube, C, communicating at top with the annular surrounding chamber, J, with the water-discharging tube, C', substantially as described.

Third, I also claim the combination of the annular detritus chamber, J, with the water-discharging chamber, C', substantially as described.

49,705.—Gas-light Multiplier.—J. F. Boynton, Syracuse, N. Y.:

First, In an apparatus for carbureting gas for illuminating purposes, I claim the use of partitions of wood, placed so that the grain shall stand vertically when those partitions are constructed with a wedge-like shape, having their lower ends thicker than their upper, substantially as described.

Second, In an apparatus of the kind above contemplated, I claim the use of cotton wicking, or other equivalent material, so arranged and contained that the number of capillary pores shall be all the while rapidly increasing as the fluid hydro-carbon becomes less volatile, substantially as and for the purpose described.

Third, I claim a combination of partitions, bars and wicks, forming a movable cage setting into a box, producing a compound capillary action of porous and fibrous material, substantially as described.

49,706.—Torpedoes for Oil Wells.—J. F. Boynton, Syracuse, N. Y.:

First, In torpedoes for oil wells, and other like uses, I claim the construction of the body of the cylinder of cast metal, inclosed in a jacket of sheet metal, and for the purpose substantially as described.

Second, In a torpedo, constructed as above proposed, I claim retaining the heads in place by means of a jacket inclosing the cylinder, and soldered to the head of the cylinder, as described.

Third, I claim the closing of a torpedo magazine with a diaphragmed chambered plug, substantially as described.

Fourth, I claim for the exploding of a torpedo the combined use of a shelling box and needle with the diaphragmed chamber plug, substantially as described.

Fifth, In a torpedo exploder I claim the use of a hammer, k, so constructed and operated that the blow, if insufficient, may be repeated without moving the torpedo itself, by means of contrivances substantially as set forth.

Sixth, In a torpedo exploder I claim the use of an aperture to preserve the uniformity of pressure on both sides of the diagram, substantially as described.

Seventh, In a torpedo exploder I claim the use of a suitable substance spread upon the powder in the magazine beneath the liquid chamber, and in such a position that the puncturing of the liquid chamber shall cause the explosion, substantially as described.

49,707.—Stove.—Moses Bratt, Maysville, Ky.:

I claim, First, The arrangement in an open or fire-place stove of an air chamber, K, communicating with the outer air and with the air of a room, between the fire chamber or the reverberating extension thereof and the upper flue space, when the said chamber is also surrounded laterally by flue or hot-air spaces, substantially as above described.

Second, I also claim the air chamber, F, located behind the fire back, b, and connected with the side air spaces, g g, and communicating with the fire chamber by means of the opening, E, and extending upward behind the box, M, to the flue, P, substantially as and for the purpose above described.

[This invention consists in a novel arrangement of air and smoke chambers in an open parlor stove, whereby air-heating surfaces are made within the walls of the stove, and the smoke and gaseous products of combustion are consumed by supplying currents of air above and below the fire.]

49,708.—Compositions for Enamels, Paints, Etc.—Morgan W. Brown, Morrisania, N. Y. Antedated Aug. 22, 1865:

I claim, First, A composition of matter, formed and prepared from ground or pulverized marble or natural lime-stone, and an alkaline silicate as a base, substantially as set forth, for purposes of an enamel cement and plaster.

Second, I claim the use of a carbonate of lime, white oxide of zinc, and silicate of alumina into the base of the composition of matter, for the purposes of a paint, enamel and cement, substantially as set forth.

Third, I claim the mode or process for the preparation of alkaline silicates preparatory to its use in my composition of matter, and for its uses as a varnish in the application of a paint, enamel and plaster, substantially as described.

Fourth, I claim the use and application of the different colors and shades of color by the mode or process of blending by concussion or otherwise into my composition of matter while the same is soft or fluid, and before the same becomes hard, substantially as set forth.

Fifth, I claim the mode and the application of certain temperatures of heat to the articles fabricated from my composition of matter, and to metallic or earthy substances, coated and enameled therewith, substantially as set forth.

Sixth, I claim the use of an oil or an oil and resinous varnish over the composition of matter, after the same have become dry, in one or more coating, substantially as set forth.

Seventh, I claim the use and application of sand and pebbles into my composition of matter, for the purposes of a cement, etc., substantially as set forth.

49,709.—Cigar Machine.—Geo. Buckle, Monroe, Mich.:

I claim the method, substantially as herein described, of producing the fillers for cigars, by first forming a sheet or felt of tobacco and then cutting up that sheet in a clamp in pieces suitable for fillers, and having wrapped these fillers in narrow strips cut from tobacco leaves, pressing them in a suitable press, as set forth.

49,710.—Spirit Level.—R. F. Burnett, New York City:

I claim the case, C, composed of two trough-shaped boxes, arranged diametrically in annular flanges, which are secured in the socket, B, substantially in the manner and for the purpose set forth.

Also, The adjustable spring catches, e, in combination with flanges, c, case, C, and socket, B, constructed and operating substantially as and for the purpose described.

[The object of this invention is to facilitate the operation of introducing the vial into the case of a spirit level, and to arrange said case so that the vial can be readily adjusted to any desired angle.]

49,711.—Milk Can Bottom.—Asahel Burnham, Arkwright, N. Y.:

I claim making the bottom, B, of the can crowning or conical in form, with radiating strengthening ribs, S S, on the under side thereof, in the manner and for the purpose set forth.

49,712.—Lock.—W. C. Bussey, Jackson, Cal.:

I claim, First, The employment or use of a series of rings, E E' E'', and a cylinder, E''', provided respectively with teeth and pawls, and also with annular tumblers, g, to operate in connection with notched arms, C, through which the bolts, B, are moved, substantially as and for the purpose set forth.

Second, The peculiar construction of the arms, C, applied to the bolts, B, and arranged with the tumblers, g, to operate in the manner substantially as and for the purpose set forth.

[This invention relates to a new and improved lock, of that class in which a series of rotating annular tumblers are employed, and it consists in a novel arrangement of such tumblers, in connection with arms, one or more, and connected with one or more bolts, whereby an extremely simple and efficient burglar-proof lock is obtained.]

49,713.—Guard Finger for Harvesters.—Clark T. Bush, Rensselaerville, N. Y.:

I claim facing, or lining both faces of the slot of the guard fingers of a harvesting machine through which the cutter vibrates, substantially as and for the purpose set forth.

49,714.—Machine for Grinding Apples.—Robert Butterworth, Trenton, N. J.:

I claim, First, A cast-metal cylinder, provided with longitudinal boxes, a, to receive the knives or cutters, D, which boxes project beyond the ends or heads of the cylinders, to receive set screws, E, for setting the knives or cutters, and securing them in position, substantially as set forth.

Second, The sectional concave, composed of plates, H, provided with joints, and having springs, I, bearing against their lower ends, and regulated by rods, L, and nuts, h, substantially as described.

Third, The regulating of the pressure of the spring, I, against the plates, H, by means of the heads or blocks, J, on the fixed shaft, K, and the set screw, f, substantially as set forth.

[This invention relates to a new and improved machine for grinding apples for the manufacture of cider, and it consists in a novel and improved construction of a grinding or cutting cylinder, and also in the employment or use of a series of pressure plates, arranged with springs in such a manner that the work may be done in an expeditious and perfect manner.]

49,715.—Cultivator.—George Calkins, El Paso, Ill.:

I claim, First, The combination and arrangement of the plow beams, D, levers, F, supports, K, levers, E, provided with the rods, L, the cross piece, H, and frame e, O, when constructed and operating substantially as and for the purposes set forth.

Second, I claim the combination and arrangement of the plow beam levers, E and F, provided with their fulcrums, as described; cross piece, H, frame, O, and the levers, M and N, when constructed substantially as and for the purposes described.

49,716.—Pump.—James Camack, Dane, Wis.:

I claim the combination of the water chamber, D, with the cylinders, A, chambers, B, air chamber, C, and the valves, e and i, all arranged and operating as herein set forth.

49,717.—Expanding Drills for Well Boring.—G. F. Case, Brooklyn, N. Y.:

I claim, First, Enlarging the diameter of the bottom or other part of an artesian well, substantially as shown.

Second, I also claim advancing the tool, D, in a horizontal direction, substantially as and for the purpose above described.

Third, I also claim, in combination, the tube, H, the shaft, B, the tool, D, toothed as described, and the heb, I, substantially as shown.

49,718.—Breech-loading Fire-arm.—Cyprien Chabot, Philadelphia, Pa. Antedated June 15, 1865:

I claim, First, The combination of the withdrawer, G, and ejector, e, for backing and throwing out the empty cartridge case when the ejector is detached from, but operated by, the withdrawer as it flies back, substantially as herein described.

I also claim so arranging the ejector, e, with regard to the paths of the withdrawer and the cartridge case, as that its ends, 2 3, shall be alternately thrown down and up by them as they pass over them, as and for the purpose herein described.

I also claim so arranging the breech-block bolt and the striker or exploding pin as that the latter shall be locked out by the bolt should the bolt fail to shoot into its catch or keeper, as and for the purpose described.

I also claim forcing the bolt into its keeper, if, from any casualty, it failed to shoot home by the blow of the hammer upon the exploding pin or striker before it reaches the cartridge, or simultaneously therewith, substantially as and for the purpose set forth.

49,719.—Soda Fountain.—F. J. Chapman, Huron, Ind.:

I claim the pump cylinder, C, provided with perforated sides, and applied in combination with a vessel, A, containing soda water or other liquid, and with a suitable piston and discharge pipe, substantially as and for the purpose described.

[This invention consists in a pump cylinder, with perforated sides, and combined with a suitable vessel containing soda water or other gaseous liquid and with a discharge pipe, in such a manner that when the piston which works in the pump cylinder is raised above the perforations in the sides of said cylinder, the soda water or other liquid descends, and, on depressing said piston, the liquid contained in the lower part of the cylinder is forced out through the discharge pipe, and a pump is thus obtained which operates without any valve or other part that would be liable to get out of order.]

49,720.—Seeding Machine.—Morell Clark, Castalia, Iowa:

I claim the frames, F, attached to or fitted upon the shaft, E, and provided with the shafts, J, having teeth arms, K, attached, and the bars, M, in connection with the catches, N, all arranged to operate substantially as and for the purpose set forth.

I also claim the adjustable perforated plates, P P, in connection with the perforated bottom, a, of the seed box and the biconical tubes, O, provided with the internal cones, c, substantially as and for the purpose specified.

I further claim the rods, R, passing through the tubes, O, provided with the heads or caps, S, and vibrated as shown to insure the free discharge of the seed.

[This invention relates to a new and improved machine for sowing seed in drills or broadcast, and it consists in a novel arrangement and application of teeth for covering the seed, whereby the teeth are prevented from becoming choked or clogged with weeds, trash, etc.; and the invention further consists in a novel seed-distributing device, whereby the seed is prevented from choking or clogging in the seed box, and, consequently, evenly distributed, and the amount of seed to be sown on a given area regulated as desired.]

49,721.—Saw Mill.—Gilbert H. Clemens, U. S. Army:

I claim the provision upon each head block of the two sets of setting apparatus, C E e e' M C' F' e e' M', operated alternately and with unequal speed from a high band wheel, substantially as set forth.

49,722.—Railway Chair.—John Cochrane, Wall Tunship, N. J.:

I claim the combination of a spring, or springs, with the rails and chair, or coupling, so as to prevent looseness of the joints, substantially as described.

49,723.—Boot.—Earle D. Coffee, Holliston, Mass.:

I claim the improved mode of making the outer sole of a tap, boot or shoe, viz., of the separate pieces, a b c, the welts, d c, and the fillings, i g, arranged and applied together and with respect to the insole, h, substantially as described.

49,724.—Ice Pitcher.—Charles Conradt, Philadelphia, Pa.:

I claim combining with an ice pitcher, A, a stand or support, B, so that the same will operate together, substantially in the manner described and set forth, for the purposes specified.

49,725.—Packing Ring for Piston Rods.—W. C. Cornwell, Scranton, Pa.:

I claim the box, A, containing a wide-split ring, a, and two narrow-split or sectional rings, b, b', in combination with the follower, B, and with holes, d, admitting steam to the outer surface of the ring, a, substantially as and for the purposes set forth.

[This invention relates to metallic steam packing for piston rods, valve rods, etc., of steam engines, to be applied by placing the same in the ordinary stuffing board.]

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49,726.—Axle Box.—Charles Cook, Winsted, Conn.:
I claim, as an improved article of manufacture, a box for the axles of vehicles, constructed of wrought iron, with a true or finished interior surface, and hardened by the usual case-hardening or steel-converting process, substantially as set forth.

49,727.—Match Card.—Moses G. Crane, Boston, Mass.:
I claim, as a new article of manufacture, match cards, having a construction substantially as described.

49,728.—Steam Generator.—Clay Crawford, East Cleveland, Ohio:
I claim so arranging the tubular grate bars, b, in relation to the flues, a, and fire-place, and draft, that the products of combustion in said fire-place will pass down from the top, around the grate pipes, in accordance with the direction of the draft, substantially as and for the purpose set forth.
I also claim the grate pipes and flues, when arranged in relation to each other and the boiler, substantially as and for the purpose set forth.

49,729.—Table.—Richard R. Crowe, Chicago, Ill.:
I claim the combination and arrangement of the table top, A with the leaves, B C D E, and auxiliary leaves, F G H I, operating as and for the purposes shown and set forth

49,730.—Seeding Machine.—H. D. Dann, Waupun, Wis.:
I claim, First, In combination with the parts, M and N, forming the seed cells of a seeding machine, the rod, R, arms, T, and lever, S, arranged and operating substantially as described.
Second, the seed tubes, J, suspended from the frame of the machine, so that they may at all times hang in a vertical position, substantially as described and for the purpose set forth.

49,731.—Seat for Water Closet.—J. N. Davis, Georgetown, Ohio:
I claim a water-closet seat hung upon a fulcrum, and having a suitable guard frame attached to it, all substantially as described and for the purpose specified.

49,732.—Joints of Skirt Hoops.—Theodore D. Day, New York City:
I claim a clasp for the hoops of skirts, formed substantially as specified, so that it will fold inward or turn, but will not fold outward, as set forth.

49,733.—Plow.—O. P. Dills, Falmouth, Ky.:
I claim the adjustable bar, F, with the wheel, I, rack, J, wheel, D, and standard, C, in combination with the rigid arm, B, all constructed and arranged substantially as shown and specified.

[This invention consists in providing a plow with two wheels, arranged in such a manner that the plow will be self-supporting—that is to say, require no guidance, as is the case with the ordinary single plow—and admit of the driver riding on the plow, without subjecting it to any increased downward pressure to effect its action in the soil, and, at the same time, be capable, by a simple manipulation, of being adjusted to penetrate the earth at a greater or less depth, according to the depth of furrow required.]

49,734.—Releasing the Tail Board of Wagon.—Casper Dreher, Detroit, Mich.:
First, The rock-shaft, E, provided with the tappets, b, and lever, a, or their equivalents, substantially as and for the purpose specified.
Second, The combination of the rock shaft, E, tappets, b, lever, a, and spring catch, D, substantially in the manner shown and described.
Third, The tappets, b, when connected to a suitable rock shaft, and arranged to operate substantially as herein shown and described.

[The object of this invention is to provide a simple device for instantly and effectually releasing the board of wagons; and it consists in the employment of a rock shaft, extending across the tail board of the wagon, and provided with tappets on its ends, which bear against the noses of the spring catches that are usually used for holding up the tail boards of wagons, in such a manner as to throw them up whenever the rock shaft is turned by a hand lever attached to it for that purpose.]

49,735.—Animal Trap.—Alfred Edwards, Chicago, Ill.:
First, I claim the combination of the lever, E, sliding door, y, uprights, J, and movable platform, K, arranged and operating substantially as and for the purposes herein set forth and shown.
Second, I claim the combination of the cups, F F, and tube, H, containing fluid as described, with the lever, E, and slide y, arranged and operating as and for the purpose set forth.

49,736.—Machine for Making Paper Bags.—B. F. Ells, Dayton, Ohio:
I claim the employment of the block, A, and the folders, c d e f, constructed, arranged and used as and for the purposes specified.

49,737.—Device for Removing Cars from the Track.—D. R. Erdmann, Philadelphia, Pa.:
I claim the portable bar, A, with its inclined flange, a, and curved shoulder, b, and having projections, e e, or their equivalents, the whole being constructed and adapted to a rail, substantially as and for the purpose herein set forth.

49,738.—Measuring Funnel.—J. M. Estabrook, Worcester, Mass.:
I claim a measuring funnel provided with a central stem and valve, which rises and falls by the action of a spiral groove, said stem being furnished with a series of marks, substantially in the manner and for the purpose set forth.

[This invention consists in a measuring funnel provided with a central stem, which is guided in a socket with a spiral groove, and provided with a pin projecting through said groove, and with a valve at its bottom end, and with a series of shoulders or marks at certain intervals, in such a manner that by the action of the pin and spiral groove the stem, on being turned, rises and falls, and the valve opens and closes, and when the valve is closed, and the funnel filled partially or fully with liquid, the exact quantity of liquid contained in the same can be observed by the marks on the stem, and after the liquid has thus been measured, it can be readily discharged by turning the stem and raising the valve.]

49,739.—Process of Distilling Petroleum.—Levi S. Fales, Boston, Mass.:
First, I claim the distillation of crude petroleum or other oils by heat applied above the surface, through the medium of a current or currents of air circulating through the upper part of the still, substantially as herein specified.
Second, The combination, substantially as described, of a still, an air pump or blower, an air-heating furnace, a rose, or other air-distributing device, and a pipe for conveying air from the said pump or blowers through the said furnace to the said distributing device, the whole operating as and for the purpose herein specified.

49,740.—Method of Setting Stills.—Levi S. Fales, Boston, Mass.:
I claim the combination, under one retort, of two furnaces, D D, two parallel partition walls, C C, which partly support the bottom of the retort, and a central or intermediate return flue, I, common to both furnaces, and forming their communication with the chimney, the whole constructed and arranged within the inclosing walls of the still, substantially as and for the purpose herein set forth.

49,741.—Skate.—David J. Farmer, Newark, N. J.:
First, I claim the use of a scroll, D or D', in combination with radially-sliding hooks fitted into the heel-plate or toe-plate of a skate, or in both, substantially as and for the purpose described.
Second, The application of a spring catch, g, in combination with the heel-plate or toe-plate, or both, or with both, and with the revolving scroll plate, D D', substantially as and for the purpose set forth.

[This invention relates particularly to a new and improved method of attaching the skate to a boot or shoe, and it consists in the use of a stationary disk forming the guide for two or more radially-sliding hooks, the inner ends or shanks of which catch in a scroll rising from or sunk in the surface of a revolving plate.]

49,742.—Railroad Rail.—Benjamin F. Farrar, Springfield, Mass.:
I claim the combination of the rails, a a, piece, A, spring or springs, B, and chair, D, substantially in the manner and for the purpose described.

49,743.—Horse Collar.—C. J. Fisher, Waukon, Iowa. Antedated Aug. 27, 1865:
First, I claim the wooden front parts, A A, of the collar, connected at their upper ends by a yoke or pad, B, of leather or other flexible material, substantially as set forth.
Second, The attaching of the yoke or pad, B, to the wooden pieces, A A, by the bolts, b, in connection with the bars, C C, substantially as and for the purpose specified.

49,744.—Paper Holder.—J. W. Foard, San Francisco, Cal.:
First, I claim a holder for newspapers and documents, constructed and operated substantially as above described, the fastening pin or pins being clamped by the action of a screw.
Second, I also claim in newspaper holders or files the combination of a hinge at one end, with the fastening pin at the other end, constructed and arranged substantially as above described.

49,745.—Sewing Machine.—Jacob L. Frey, New York City:
First, I claim a looping instrument, formed in the manner specified, and to which the movements described are communicated, to draw a loop of thread from below the cloth, and present it to the needle above the cloth, as set forth.
Second, I claim the finger, S, around which the loops are laid in performing the sewing, and from which they are discharged as the material moves, as and for the purposes set forth.
Third, I claim the levers, g and o, the rod, f, and the diagonal cam, p, in combination with the looper, i, for imparting to the same the required movements, as specified.

49,746.—Traction Engine for Common Roads.—Jesse Frye, Brooklyn, N. Y.:
I claim, First, Driving each wheel of the engine by a separate and independent cylinder or cylinders, and their actuating appliances, substantially as and for the purpose described.
I also claim the separate engine or steam cylinders, H, for operating the mechanism that turns the front wheels of the engine to guide or direct its movements, substantially as described.
I also claim connecting the front and rear frames, trucks or portions of the engine by means of the stem or bar, G, substantially as and for the purpose described.
I also claim attaching the front wheels to the front frame by means of the axles, substantially such as shown and described, so that said wheels may be freely turned, and yet remain in gear with their respective driving cylinders, substantially as described.
I also claim, in combination with an engine for working on common roads or on the natural surface of the ground, a self-acting grade governor for regulating the supply of steam on ascending or descending grades, substantially as described.
I also claim dividing the smoke stack vertically into two sections, and hinging the sections so that it may be brought close down in passing over or under bridges, etc., substantially as described.
I also claim, in combination with a steering mechanism worked by steam, as described, the stationary sights, t u, and the moving one, x, for running the engine on defined lines, as described.

49,747.—Paper Shirt Bosoms.—Joseph B. Gardiner, Springfield, Mass.:
I claim as a new article of manufacture a paper shirt front, made in imitation of a cloth front, by imitating the plaits of the same by arranging and depressing parts of the same, substantially as described.

49,748.—Washing Apparatus.—Charles C. H. Glidden, Boston, Mass.:
I claim my improved manufacture or washing apparatus as having its waste water tank a support for the fresh water vase and bowl, and provided not only with devices or ledges, a b l, for holding the vessels in place on it, but with an opening or short tube, D, arranged as described to receive a pipe, c, from the wash bowl, the whole being as specified.

49,749.—Process for Making Sirup and Sugar from Indian Corn and other Grain.—Frederick W. Goessling, Jersey City, N. J.:
First, I claim the use of animal or lichen carbon and equivalents in the process of making sirup and sugar from Indian corn or maize and other grains before and after neutralization, substantially as set forth.
Second, The use of prepared carbonate of quick-lime in the manufacture of sirup and sugar from Indian corn or maize and other cereals, substantially as set forth.
Third, Pressing the sugar after it has been once crystallized, and re-melting it, and again putting it into molds for crystallization, substantially as described.
Fourth, The process or method of making sirup and sugar from Indian corn or maize and other cereals containing amylaceous matter, so far as the same is developed in each or either step or degree thereof, substantially as herein described.
Fifth, The manufacture of sirup and sugar from Indian corn or maize and other cereal grains containing amylaceous matter by the process or method substantially as herein described.
Sixth, A cane-like sirup and a cane-like sugar produced from Indian corn or maize or other grains containing amylaceous matter, as a new product of manufacture, substantially as set forth.

49,750.—Method of Making Sugar from Indian Corn or other Grain.—Frederick W. Goessling, Jersey City, N. J.:
First, I claim the method or process of manufacturing sugar from Indian corn or maize and other cereal grains containing amylaceous matter, in each or either step or degree thereof, substantially as described.
Second, A cane-like sugar produced from Indian corn or maize, as a new product of manufacture, by the method or process substantially as described.

49,751.—Method of Making Sirup from Indian Corn or other Grain.—Frederick W. Goessling, Jersey City, N. J.:
First, I claim the method or process of making sirup from Indian corn or maize and other grains containing amylaceous matter herein described, in each or either step or degree thereof, substantially as set forth.
Second, A cane-like sirup produced from Indian corn or maize or other cereals containing amylaceous matter as a new article of manufacture, substantially as set forth.

49,752.—Lamp.—Eli H. Green, Baltimore, Md.:
I claim the mode of constructing the lamp body, A, base, B, and projecting rod or tube, D, substantially as and for the purposes herein specified.
I also claim the shield, H, in combination with the lamp, as described, for the purpose herein set forth.
I also claim the construction of the burner or burners, substantially as herein specified.
I also claim the perforations, r r, notches, s s, either together or separately, in the burner lips, as a distinct improvement, substantially as and for the purpose herein set forth.

49,753.—Gate.—S. Grenell, G. Bez and H. C. Stoll, Mokena, Ill.:
We claim the lever, D, and slide, C, provided with or having the levers, F F, attached and connected with the gate, E, substantially as shown and described, to operate in the manner as and for the purpose set forth.

[This invention relates to a new and improved gate of that class which are capable of being opened and closed by a driver or rider without getting out of a vehicle or dismounting from a horse. The invention consists in hanging the gate upon a lever, which is attached to the fence and connected to a rising and falling slide, having levers connected to it, and all arranged in such a manner that the gate may be opened and closed by a rider and driver from a vehicle or on horseback with the greatest facility.]

49,754.—Mode of Coupling and Uncoupling Cars.—S. H. Hamilton, Bushnell, Ill.:
I claim the lever, F, suspended from the crane, D, and applied to the car in the manner substantially as and for the purpose set forth

49,755.—Brush for Cleaning Metallic Plates.—E. A. Harvey, Wilmington, Del.:
First, I claim fixing elastic strips or other material, A, in the head, B, so as to provide a reserve of material, which is made available when the strips are adjusted, as explained.
Second, In a brush constructed as above specified, with sockets passing completely through the head, I further claim scrubbing strips or tufts composed of or surrounded by india-rubber, to adapt them to be adjusted as required, and retain their positions in the head while in use, as explained.
Third, I claim securing the fibrous material, A, in the head, B, by means of the elastic bushing, C, substantially as described.

49,756.—Grain Binders.—John F. Hemperly and Charles Barns, West Liberty, Iowa:
First, We claim the toothed sector, E, in connection with the pinion, F, slotted plate, G, the arm, W, carrying the wire, A, and the knife or cutter, B, all arranged to operate in the manner substantially as and for the purpose set forth.
Second, The arrangement of the spool, P, and pulley, R, with the ratchets, e e, in connection with the band, R, and lever, S, substantially as and for the purpose specified.
Third, The slotted slide, I, connected with the lever, K, and arranged to operate in connection with the arm, W, for the purpose set forth.
Fourth, The arrangement of the arm, W, on shaft, X, in combination with the levers, K and S, substantially as shown, so that they will move simultaneously by the application of power to lever, K, as and for the purpose described.
Fifth, The spring catch, V, and the spring, T, arranged with the toothed sector, E, in order to hold the same until the twist is to be given the band, and then to move sector and give the hoist, substantially as described.

[This invention relates to a new and improved device for binding grain, the same being designed to be applied to a harvester.]

47,757.—Bell-pull.—Henry Horner, New York City:
I claim the combination with a bell-pull of a rubber or other suitable elastic cushion or spring, arranged substantially in the manner described and for the purpose specified.

[This invention relates to a novel arrangement of bell-pulls, especially adapted for steamboat use, the principal objects of which are to obviate the noise now occasioned by the ordinary bell pulls, and also to relieve its casing from being worn or battered.]

49,758.—Boring Brace.—J. A. and H. A. House, Bridgeport, Conn.:
We claim, First, Locking the stock of the brace with the drill stock, substantially in the manner described, for the purpose set forth.
Second, The combination of the handle, the flat link chain, and the drill stock, substantially in the manner and for the purposes set forth
Third, The sliding stops or its equivalent, substantially as and for the purposes set forth.

49,759.—Piston Packing for Deep Wells.—C. H. Jackson, Angola, N. Y.:
I claim the combination of an expansible packing shell, C, made of leather or other suitable material, with a piston head, A, so constructed as to form an annular space between it and the packing shell, which annular space communicates by means of small channels with the rising column of fluid, so that the pressure of such column of fluid will expand the packing shell outwardly against the pump barrel, substantially as described.

49,760.—Match-safe.—R. W. Jenks, Providence, R. I.:
I claim the opening of the bottom, I, in connection with the springs, F, substantially as and for the purposes set forth.

49,761.—Plow.—C. F. Johnson, Jr., Owego, N. Y.:
First, I claim the plow, running at right angles, or nearly so, to the forward motion of the machine, in connection with the groove or guides, substantially as described.
Second, I claim the plow, rotating on an axis, so as to be easily withdrawn from the ground when the stroke is finished, and again presented in a position to enter the ground.
Third, I claim the guides or grooves and the cross-head, for the purpose of steadying the plow, as described.
Fourth, I claim the arrangement of the guides and the cross-head, by which the back of the cross-head, after emerging from the guides or grooves can rise and allow the plow to turn up endwise and be withdrawn from the ground, in the manner described.

49,762.—Meat Cutter.—R. V. Jones, Canton, Ohio:
First, The combination of two cylinders, both of which are provided with spiral flanges a portion of their length, and the one the balance of its length, with a right screw or thread; the other with a left screw or thread, working together as and for the purpose herein specified.
Second, The combination of two cylinders, B and C, constructed as described, with a ribbed case, as and for the purpose herein specified.

49,763.—Railroad Joint.—K. W. King and T. C. Hargraves, Boston, Mass.:
We claim the double-headed bolts, operating in connection with the slotted fish plates to confine the rails in position, substantially as set forth.

49,764.—Scissors Sharpener.—T. K. Knapp, Worcester, Mass.:
I claim combination with the frame, A, of the discharge opening, e f, and circular cutter, C, having an enlarged hole, d, through its center, whereby all clogging of the instrument is prevented, while the periphery of the cutter, C, can be ground or turned off without impairing its operation, all as set forth.

49,765.—Tube Expander.—J. H. Knickerbocker, Philadelphia, Pa.:
First, I claim the series of radially moving arms, A A, arranged and supported in an annular base, E, so as to operate or be operated together, substantially as described, for the purposes specified.
Second, I claim the employment of removable or changeable dies, I I, in combination with the radially moving arms, A A, substantially as and for the purposes described.
Third, I also claim, in combination with an expander, provided with radially moving arms, A A, as described, the employment of the hollow conical frustrum, C, operated together by any suitable power, as and for the purposes described.

49,766.—Bureau and Commode.—Geo. W. Kock, New York City:
I claim a combined bureau and commode, either with or without a bedet, made substantially as herein described, for the purposes specified.

49,767.—Hat Ventilator.—A. Komp, New York City:
I claim a ventilator, composed of a supporting plate, A, and spring, B, secured together so as to leave a crescent-shaped space, C, substantially in the manner and for the purposes set forth.

49,768.—Steeping, Growing and Drying Malt.—A. Kreusler, New Lebanon, N. Y.:
I claim the within-described method of effecting the steeping, the growing and the drying of malt, in an apparatus composed mainly of a wire-gauze cylinder, revolving in a case with a jacket, substantially in the manner set forth.

49,769.—Lamp.—William Lassell, Boston, Mass.:
I claim surrounding the lower part of the wick tube and wick with an enlarged tube, made in two parts, one sliding within the other, to adapt it to lamps of different depths.

49,770.—Mode of Starting Railway Cars.—Wm. Lawton, New York City:
First, I claim the combination of the lever, E or E2, pawl, D, ratchet wheel, C, with the axle and draw hook of a railway car, the whole operating and constructed substantially as herein described.
Second, In combination with the double-ended pawl, D, I claim the fixed guide or projection, H, operating in the manner and for the purpose herein described.
Third, I claim the lever, J, and stop, n, in combination with pawl, D, and ratchet wheel, C, substantially as and for the purpose herein specified.

49,771.—Wagon Brake.—Nelson Lezat, New Baltimore, N. Y.:
I claim the cross bar, h, carrying the fulcrum, i, of the secondary lever, k, in combination with the horizontal levers, d d, and brake blocks or shoes, g g, as and for the purposes specified.

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49,772.—Axle Box.—Edwin Lockwood, Bordentown, N. J.:

I claim the construction and use of the packing C, composed of two parts, F F, one part, E, being fixed and the other part being adjustable, and regulated by a screw, F, or its equivalent, in combination with the chamber, B, at the rear of the box, and the plate, D, which, with the packing, is fitted in said chamber and secured in position by bolts, H, substantially as and for the purpose set forth.

[This invention relates to a new and efficient means for preventing the admission of dust, dirt, etc., into the rear end of the axle box around the axle, thereby preventing the cutting and wearing of the axle by means of grit and hard foreign substances, which would otherwise work in between the axle and the bearing in the box.]

49,773.—Projectile for Ordnance.—Orazio Lugo, New York City:

I claim the employment of a charge, D, in front of the projectile, substantially as and for the purpose herein specified.

49,774.—Basket.—E. B. Lyman, Bridgeport, Conn. (late of Waterbury, Conn.):

I claim forming a base of solid rails, D, in the construction of baskets, hampers and similar articles, and securing their sides and bottoms to the rails by means of grooves, e e', substantially as above described.

49,775.—Water-proof Fabric for Hats, Etc.—William C. Mahow, Covington, Ky.:

I claim, as a new, and cheap, and improved article of manufacture, the water-proof composition hat or cap, made substantially as described.

49,776.—Oil Can.—John Mayher, East Hampton, Mass.:

First, I claim the combination of the socketed cross bar, b, and spring, a, when located within the can, and adapted to act upon the bottom in the manner specified.

Second, In combination with the above, I further claim the disk, C, applied as and for the purpose described.

[This invention consists in a flat disk, forced by the action of a spring against the inner surface of the bottom of an oiler in such a manner that by the disk the force exerted by the spring is divided over a large surface, and injury to any part of the boiler is avoided, and at the same time sufficient electricity is imparted to said bottom to make the oil flow from the spout by a gentle pressure on it with the thumb.]

49,777.—Instrument for Testing Petroleum.—Adolph Millochar, Jersey City, N. J.:

I claim the oil receptacle, containing a wick tube or burner, to heat and inflame the petroleum or other oil, in combination with the thermometer introduced into such receptacle, for the purposes and as specified

49,778.—Packing for Oil-well Tubes.—George E. Mills, New York City:

First, I claim a packing, consisting of a tube or bag of leather, having a bottom and top secured firmly to the discharge pipe, the top forming a cup in the upper end of the leather tube, which will expand and make a valve cut-off against the walls of the well, as herein described, for the purposes set forth.

Second, I claim, in combination therewith, a gas escape-pipe, arranged in relation to the cylinder and packing, substantially as described.

49,779.—Clothes Rack.—John O. Montignani, Albany, N. Y.:

I claim First, The rod. A. with its groove, e, in combination with the hooks, H, and the rings, c, fitted to rod and for the purpose described.

Second, The bracket, consisting of a back plate, E, and hook, H, with its rings, C, and tongue, Z, united together by means of the button, X, and the hole, a, in the manner and for the purpose described.

Third, The rod, A, with its groove, e, the bracket formed by the back plate, E, and a hook, H, with its ring, C, the hooks, H, with their rings, C, and tongues, Z, in combination with each other, substantially as described, together forming an improved clothes rack.

49,780.—Door Mat.—F. V. Noyes, Mattoon, Ill.:

I claim the method, substantially as above shown and described, of making door mats of the leaves or shucks of corn, or any other suitable material, manufactured or unmanufactured.

[This invention consists in a novel way of making door mats by the use of a skeleton frame, in which are inserted corn shucks or leaves, hemp, manilla, broom corn, or any other fibrous substance, manufactured or unmanufactured, the several strands being secured in the frame by means of keys.]

49,781.—Ash-sifting Shovel.—A. M. Olds, Chicago, Ill. Antedated Aug. 25, 1865:

First, I claim constructing the bottom of a shovel of one or more movable slats, pivoted to the frame, substantially as and for the purpose set forth.

Second, Placing the tenons on which said slats swing in front of their edges, substantially as and for the purpose described.

Third, Curving the edges of the slats, substantially as and for the purpose specified.

Fourth, The arrangement of the spring catch, D, in combination with the movable slats, C, and shovel, A, constructed and operating substantially as and for the purpose set forth.

49,782.—Method of Joining Sheet-metal Bands.—William Painter, Baltimore, Md.:

I claim the lock or fastening for rims of blacking boxes and similar purposes, formed by making incisions through the lap and raising and expanding the parts between them, substantially in the manner described.

49,783.—Packing for Oil-well Tubes.—John Parkham, Jr., Philadelphia, Pa.:

First, I claim an india-rubber cup-shaped packing, having one or more indentations in it, so that it will bend or yield when the tubing for any reason is drawn from the well, and thus prevent jamming, substantially as described.

I also claim the fastening of such cup-shaped packing to the tubing by clamping its base between lock-nuts screwed into the tubing, as herein described and represented.

49,784.—Combined Pocket-knife and Pistol.—A. J. Peavey, South Montville, Me.:

I claim the trigger, t h, spring, i, main-spring, f, and hammer, H, with projections, g and p, all constructed and arranged as and for the purposes described.

[This invention consists in the arrangement of small barrel and suitable mechanism for exploding the charges within the handle of an ordinary pocket-knife, in such a manner that the pistol attachment does not in any way interfere with the ordinary use of the knife, and the whole can be conveniently carried in the pocket.]

49,785.—Device for Stripping Cane.—T. W. Peirce, Minneapolis, Minn.:

I claim the radial sections, B, fitted to the annular plate, A, and encompassed by an elastic band, C, substantially as and for the purpose set forth.

I further claim having the upper ends of the parts, c, of every alternate section, provided with projecting ends, to lap over the ends of the intermediate sections, substantially as and for the purpose specified.

[This invention relates to a new and improved device for stripping the leaves from sugar cane, preparatory to crushing and expressing the juice therefrom. The invention consists in placing a series of radial sections in an annular plate, and encompassing the same with an elastic band, whereby the sections are made to press against the stalks of cane, and at the same time allowed to yield or give to accommodate themselves to the varying thickness of the stalks while the latter are being drawn through the central opening formed by the inner surfaces of the sections.]

49,786.—Spring.—J. C. Plumer, Boston, Mass.:

First, I claim a spring, which is constructed of two or more arms or levers, united by joints, and which derives its elasticity from a piece or pieces of rubber fixed in or between the arms, as described.

Second, The plates applied to the exposed surfaces of the rubber, and connected by a bolt, in combination with the described spring, both as and for the purposes described.

49,787.—Reservoir for Compressed Air.—Louis Ransom, Lansingburg, N. Y.:

I claim the coil, c, immersed underwater, in combination with the supply pipe, b, and reservoir, A, constructed and operating as and for the purpose set forth.

This invention relates to a receiver or reservoir, which is designed to receive the air from a condensing engine, and, from its large radiating surface, give off the heat, which, by compression, is liberated from the air, while, to facilitate the operation of cooling, the tube leading from the condensing engine is immersed in water, and the air forced through it into the tubes or vessels constituting the reservoir. The air compressed into this reservoir is designed to propel street cars, other vehicles and machinery.]

49,788.—Register for Libraries.—W. T. Ray, Philadelphia, Pa.:

I claim a library register, constructed, arranged and operated in the manner herein described.

49,789.—Shirt-collar Stud.—Joseph Ridge and S. F. Estill, Richmond, Ind.:

We claim, First, Pivoting the face-plate to the under portion of the fastening, so that it may be swung around to expose the shank or lock the ends of the collar, substantially as described and represented.

We also claim the combined pivoting and hinging of the face-plate to the shank or under plate, so that it may be swung around on its pivot and then raised upon its hinge for readily removing or replacing the stud, and locking it when in place, substantially as described.

Second, We also claim, in combination with a shank that will fill, or nearly so, the button-holes of the collar or other garment, the arranging of the long diameter of the back button at right angles to the line of length of said shank, so that the shank shall prevent the stud from turning, and thus allow the back button to come out of its button-hole, substantially as described.

49,790.—Naval Grappling Apparatus.—Silas Riggs, Blanchester, Ohio:

I claim the overhanging hooked bar, D, shield, E, vertical guides, F, and actuating windlasses, G and H, or their equivalents, the whole being arranged and operating substantially as set forth.

49,791.—Sawing Machine.—F. W. Robinson, Richmond, Ind.:

I claim the combination of the bent and slotted saw bar, G, fixed roller, H, crank or wrist wheel, E, and pitman, F, as and for the purpose described.

[This invention relates to a machine of simple construction for sawing wood or logs transversely with the grain, and is more especially designed for sawing cord or fire-wood by horse-power. The object of the invention is to obtain a simple device for the purpose specified; one which may be cheaply constructed and not be liable to get out of repair or become deranged by use. The distinctive feature of the invention consists in the means employed for giving the downward pressure to the saw, whereby the excessive friction attending the plans now employed for that purpose is avoided.]

49,792.—Bullet for Rifled Fire-arms.—Wm. Rosee, New York City. Antedated Aug. 25, 1865:

I claim an elongated soft metal bullet, constructed with a cylindrical portion, a, to fit the lands of the bore, without entering the grooves, with a band, b, around the rear, of such size as to enter the grooves of the bore in loading, and with a cylindrical teat, c, at its front extremity, the whole combined substantially as and for the purpose herein specified.

49,793.—Stopper for Bottles.—Frederick Schlich, New York City:

First, I claim securing the swinging bail by the fulcrum loops, formed and secured in the manner set forth.

Second, I claim the elastic stopper, in combination with the tapering projection, l, and screw, o, as and for the purposes specified.

Third, I claim the swinging bail, in combination with the elastic stopper and wing or wings, 2, as and for the purposes specified.

Fourth, I claim the stopper, formed of india-rubber, with a flange to take the top of the bottle and the cylindrical portion entering the neck, so as to render the stopper tight, as set forth

49,794.—Clothes Sprinkler.—E. Schnurr, Monroe, Mich.:

I claim a device for sprinkling clothes, consisting of a reservoir, A, provided with a suitable air duct, C, constructed substantially as herein shown and described.

[The object of this invention is to provide a handy little device for effectually sprinkling clothes before ironing the same, and it consists of a reservoir having a perforated face or bottom and a suitable handle attached thereto, and an air tube or duct communicating with the reservoir and opening out on one side of the handle thereof, for admitting air when it is desired to use the sprinkler.]

49,795.—Sole for Boots and Shoes.—S. J. Seely, New York City:

I claim the combination of a thin, metallic sole, corrugated at its shank with the sole and insole of boots or shoes, when turned over upon and sewed or pegged into the insole, and arranged between them, substantially in the manner and for the purpose described.

49,796.—Quartz Crusher.—Daniel Sexton, San Gabriel, Cal.:

I claim the employment or use of the cams, C, in connection with wheels, I, on the stamp rods, H, all constructed and arranged to operate in the manner and for the purpose herein set forth.

[This invention relates to a new and improved machine for crushing quartz, and it consists in the employment or use of a series of cams placed on horizontal shafts, in connection with fixed wheels placed on the rods of the stamps, all being so arranged that the cams will elevate the stamps by acting against the wheels, and the stamps rotated while being elevated and also while falling, so as to insure the stamps wearing evenly.]

49,797.—Ice-cream Freezer.—John S. Shattuck, Medford, Mass.:

I claim the stand elevator, having three cams or projections which raise and lower the tub and cream can into or out of connection with the gears, and at the same time afford a fixed base or support for the tub, as specified.

49,798.—Drill for Artesian Wells.—Jehyleman Shaw, Bridgeport, Conn.:

I claim a drill for boring a path for the soil-pipe through bowlders and other hard objects which obstruct the descent of such pipe, constructed and operated substantially as above shown.

47,799.—Plow.—William S. Spratt, West Manchester, Pa.:

I claim an off-set or bed for the plowshare of cast-steel or wrought-iron plows, said off-set or bed being made separate from, or in connection with the mold-board, and welded to the land side, as herein described and set forth.

49,800.—Horse-rake Teeth.—Ariel B. Sprout, Hughesville, Pa.:

First, I claim grooving or hollowing the sides of the tooth so that its thickness through its center on the line, d, Fig. 3, may be less than on the lines, a b, same figure, in order to place the greater amount of metal where it is needed to give effectiveness with economy of material.

Second, The combination of the taper with the curve of the tooth, said taper extending from about the portion C to the point d, said curve being about a semi-circle, so that by the combination of the taper and the curve the inward tractive power of the curve is gradually increased from the point d to about the portion C, substantially as herein described, and for the purpose set forth.

49,801.—Hydrant.—Albert Stephenson, St. Louis, Mo.:

I claim a portable or removable hydrant, composed of the chamber, B, and pipe, D, connected by a screw or other coupling, and provided with a valve, F, at the lower end of D, a discharge spout, J, and a waste valve, K, arranged to operate with the opening, j, in D, substantially as set forth.

I further claim the box, A, when used in combination with the hydrant, constructed and arranged as described.

[This invention relates to a new and improved hydrant for drawing and stopping at will water or other fluids from reservoirs, or from pipes fed or supplied from reservoirs. The object of the invention is to obtain a hydrant which may be readily removed or detached when necessary, and also readily applied to the main, and one which will admit of the escape of the waste water, so as to avoid the contingency of the hydrant freezing up in winter.]

49,802.—Pendulum Level.—B. F. St. John, Shelbyville, Ind.:

I claim the index hand, D, extending from the extreme hand of the pendulum, B, and bent around the edge of the dial, C, in combination with the central stud, b, constructed and operating as and for the purpose set forth.

[This invention relates to an improvement in that class of levels in which the position of the index hand is governed by the action of a weight which swings on an axle or stem.]

49,803.—Sewing Machine.—J. N. Tarbox, Buffalo, N. Y.:

First, I claim the combination of the following devices:—1st, A looper, formed as an arc of a circle, with an eye near the end, and a groove extending along the side and edge thereof to an eye near the back end; 2d, An arm at the end of a rock shaft, placed diagonally to the bed of the machine and to the feed; 3d, A pinion and segment acted on by a cam, for giving motion to the looper, and carrying the point and eye from below the cloth up over the edge, and, 4th, an eye-pointed needle acting from above the cloth and taking a loop from the looper, and having a loop of thread taken from itself below the cloth, substantially as specified.

Second, I claim the combination of an eye-pointed needle, acting from above the cloth, and a looping instrument acting from below the cloth in the arc of a circle, at an inclination to the eye-pointed needle, as specified, with a pressure foot acting to keep the cloth to the bed, but capable of being swung aside for passing the button hole over the point of the looper, as specified.

Third, I claim the eye-pointed needle, curved looper, and swinging pressure foot, fitted and acting as aforesaid, in combination with the hook, y, for holding the button-hole open when the looper ascends, as specified.

Fourth, I claim the hook, g m, in combination with the looper, for the purposes and as specified.

Fifth, In combination with an eye pointed needle acting above the cloth, and a looping instrument passing up from below the cloth, and delivering its loop of thread over the needle, in the manner specified, I claim the cam, p, lever, m, and eye, 5, to take up the slack of the needle thread, as specified.

Sixth, The combination with the eye-pointed needle, i, and looper, o, operating substantially as specified, I claim the heart-shaped slot, h, and crank pin, l, or equivalent mechanism, for communicating the movement specified to the needle, so that the same will pause while in the cloth, and move rapidly when out of the cloth, as specified.

49,804.—Printers' Blanket.—John Taylor, Lawrence, Mass.:

I claim an india-rubber printing blanket, having an absorbent and slightly elastic or yielding surface, composed of cork or other suitable substance, for the purpose specified.

49,805.—Hod Elevator.—W. H. Totten, Academia, Pa.:

I claim hoisting a hod by means of a movable elevator, C, constructed and operating substantially as described.

49,806.—Rein Holder.—T. L. Tripp, Prescott, Wis.:

First, I claim a device for holding the harness reins, consisting of the jaws, D D, substantially as herein specified.

Second, The combination of the jaws, D D, body, A, projecting jaws, a a, spring, e, substantially as shown and described.

Third, Making holes or slots, c c, in the body, A, through which to pass the reins, to prevent their becoming tangled and twisted, substantially as described.

49,807.—Table and Apparatus for Invalids.—Stephen Ustick, Philadelphia, Pa.:

First, I claim the combination of the bars, B B, with the bracket, A, for the support of the table, C, when the said bracket is connected with a bedstead, substantially as described.

Second, The combination of the book support, G, writing board, I, and looking-glass, J, with the table, C, by means of the slide, H, and way, F, substantially in the manner above set forth.

49,808.—Dies for Furniture Nails.—Wm. H. Van Gieson, Waterbury, Conn.:

I claim a series or set of dies, A C E D and F G, for forming and attaching the heads of furniture nails to the shanks, substantially as described and to the effect set forth.

49,809.—Steam Engine.—G. J. Washburn, Worcester, Mass.

First, I claim the combination of the pistons, B B, discs, C C', attached to a stem, D, with a cylinder provided with ports, which open into the spaces between and beyond the discs and pistons, in the manner and for the purpose described.

Second, I claim combining two or more such cylinders by means of connecting passages, through which live steam or other fluid under pressure is supplied from one cylinder to another, making the discs, c c, which are located between the pistons of one cylinder, act as a valve to the other cylinder or cylinders, whether the described apparatus be used as an engine or a valve.

Third, I claim arranging a valve which gives steam to the effective spaces between the pistons, and upon the same stem with them.

Fourth, I claim arranging a valve which connects the effective spaces with the exhaust pipe between the pistons and upon the same stem with them.

Fifth, In combination with the said pistons, B B, disks, C C', and stem, D, I claim arranging the crank of the main shaft within the stem or exhaust space of the cylinder.

Sixth, I claim the arrangement of the valves for determining the extent of the expansive action, by proportioning the width of the disks and ports, as described.

Seventh, I claim imprisoning a body of steam, of not over a determinate pressure, within the cylinder, for the purpose described, by means of closing the exhaust, as described.

Eighth, I claim so arranging the loop on the piston stem, or its equivalent, as to cause the piston to pass the midlength of its cylinder before its crank has reached its midway or vertical position.

49,810.—Steam Generator.—Geo. J. Washburn, Worcester, Mass.:

First, I claim, in apparatus so constructed as to use volatile results of combustion, in combination with the steam under equal pressure, the cleanser, E, which is distinct from the boiler, and within which the said volatile products are cleansed.

Second, In apparatus so constructed as to use the volatile results of combustion, in combination with steam under equal pressures, I claim the cleanser, E, Fig. 1, within which steam is generated by the heat of the said volatile products, which pass through and are cleansed therein.

Third, In apparatus so constructed as to use the volatile products of combustion, in combination with the steam under equal pressures, I claim the generator placed inside of the furnace.

49,811.—Apparatus for Removing Hair and Lime from Hides.—Samuel S. Weed, Stoneham, Mass.:

I claim the corrugated cylinder, B, with the rubber or elastic material, b, operating substantially as and for the purposes specified.

I also claim the feed rolls, J K, in combination with a corrugated cylinder, B, operating substantially as described.

I also claim the pressure roll, E, in combination with a corrugated cylinder, B, and feed rolls, J K, operating substantially as set forth.

I also claim the combination of a corrugated cylinder, B, feed rolls, J K, and the yielding pressure roll, E, operating substantially as set forth, for the purposes described.

49,812.—Horseshoe.—Augustus Weitman, West Union, Iowa:

I claim the lips or spurs, D, on the upper surface of each part, A, of the shoe, in connection with the flanges, C, screws, b, and the flange, G, at the front of the shoe, substantially as described.

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I further claim constructing the shoe of two equal parts, A A' connected at their front ends by a pivot, a, when used in connection with the plate, F, attached to said parts by screws, H, and either with or without the flanges, c, as set forth.

[This invention relates to a new and useful improvement in that class of horseshoes which are attached to the hoof without the aid of nails. The object of the invention is to obtain a means for securing the shoe to the hoof without the use of nails, and which will prevent the animal becoming hoof-bound, and at the same time firmly secure the shoe to the hoof.]

49,813.—Stirrup Fastening.—C. H. Wellman, New York City:

I claim the combination with a sliding hook or pin of a buckle, made of any desired shape, a hinged or pivoted side, arranged and operating together substantially in the manner described and for the purposes specified.

49,814.—Loom.—Joseph Welsh, Philadelphia, Pa.:

I claim producing the herein-described changes in a loom, by means of any suitable device, to be operated by hand at the will of the attendant, substantially as and for the purpose described.

49,815.—Baling Press.—Joseph P. White, New York City:

I claim the rack rod, E, and hollow screw spindle, F, when employed in connection with the worm wheel, G, worm, I, and pinion, d, to operate the follower, K, in the manner described.

49,816.—Plow.—E. G Whiting, Northfield, Minn.:

I claim lapping he forward portion of the share, E, around the standard, C, as described and represented at b b', Fig. 4.

[This invention consists in a novel and improved manner of constructing steel plows, whereby the same may be readily kept in repair or proper working order, the several parts being capable of being detached when worn, and new parts inserted in their place.]

49,817.—Grain Register.—Jonas T. Wiley, Claytown, Iowa:

I claim, First, The registering apparatus, substantially as described, consisting of the crank, shafts, wheels and indices, in combination with the projection on the shaft and the snapping spring, which audibly indicates the scoring, and prevents the revolution of the shaft in the wrong direction.

Second, The combination of the plate, Q, with the spring, F, and shaft, D, by which the machine may be seen in the reverse direction when the plate is interposed to prevent the engagement of the projection, E, on the end of the spring, F.

Third, The arrangement of the shafts, J K L, and the strap, M, with the opening in the side of the box, and the unshipping slot, S, substantially as described.

49,818.—Seeding Machine.—Henry Williams, Kenosha, Wis.:

I claim the employment or use in a seeding machine of two shafts, D D, provided with oblique seed-distributing wheels, E, and having the wheel, B, on which the machine is mounted secured to them, substantially as and for the purpose herein set forth.

Second. The peculiar form or construction of the seed-distributing wheels, E, substantially as herein specified.

[This invention relates to a new and improved machine for sowing seed broadcast, and it consists in a certain construction and arrangement of parts, whereby the seed may be sown in greater or less quantity over a given area, as may be required, and the work performed in a superior manner, and with very little labor or manipulation on the part of driver or operator.]

49,819.—Gate Fastening.—John P. Woodcock, Bedford, N. Y.:

I claim the combination of the thumb spring levers, m m, spring levers, h h, with hook-shaped ends, and hollow casing or socket, r, arranged together substantially in the manner described and for the purpose specified.

[For an illustration and description of this invention see No. 1, present volume, of the SCIENTIFIC AMERICAN.]

49,820.—Fence.—Wm. D. Woodruff, Phelps, N. Y.:

I claim the combination of the metallic feet or angle irons, C, with the posts, B, and longitudinal bars, C, the whole constructed and operated substantially as described.

49,821.—Chest and Table.—G. W. Zeigler, St. Louis, Mo.:

I claim the double lids, a b, the same being hinged together at e e, and the lid, a, hinged to the box, A, by means of the straps, f f, so that in one position, a and b only serve as a lid to the chest, so that when in another position a b and the chest form a kitchen table, and in a third position the same form a dough-kneading board, arranged and constructed as hereinbefore set forth.

49,822.—Fastening for Scythes.—Wm. C. Barker, Providence, N. Y., assignor to B. B. Yale, New York City:

I claim the securing of scythes to snaths by means of an eye bolt, e, arranged in such a manner as to clamp firmly the heel or tang of the scythes to the chamfered surface of the snath, and at the same time admit of being adjusted laterally, so as to place the scythes in a more or less angular position with the snath, substantially as shown and described.

[This invention relates to a new and improved fastening for securing scythes to their snaths, whereby the scythe may be readily adjusted more or less angularly with the snath; that is to say, the point of the scythe adjusted nearer to or further from the operator, as may be desired, and the scythe at the same time firmly secured to the snath.]

49,823.—Steam Blower for Furnaces.—John A. Bassett, Salem, Mass., assignor to Oliver Burnett, Farming, Mass.:

I claim a steam blower constructed of the mechanical elements, and to operate substantially in the manner and by the means as hereinbefore specified, such elements being the rotary steam jet wheel, its hollow arbor, the fan wheel, and an opening or case surrounding such fan wheel, the whole being for application to a furnace, in manner and for the objects as set forth.

49,824.—Galvanic Battery.—John Blackie (assignor to himself, William C. Dodge and William S. King), Washington, D. C.:

I claim, First, The cup, B, suspended by the insulated rods, g, and plate or ring, h, as herein shown and described.

Second, I claim the perforated plate, a and a', provided with the stud, c, and nut, d, when constructed as and for the purpose herein set forth.

Third I claim the combination of the cup, B, provided with mercury, the zinc plates, C, and the silver plate, D, all submerged and arranged to operate substantially as and for the purpose set forth.

49,825.—Machine for Covering Cord.—John Buser (assignor to Heinemann & Silbermann), New York City:

First, I claim the trough, y, in combination with a series of rollers, or equivalent apparatus, to present the foundation threads to said trough and apply to them the required tension while being drawn along said trough and twisted, substantially as specified.

Second, I claim, in combination with the trough, y, the ring covering head, with its pins for guiding the covering threads as they are twisted upon the foundation as the latter passes from the trough to the fly or spool, as specified.

49,826.—Process for Rendering Leather Water-proof.—G. Conklin (assignor to Caroline A. Conklin), Conklingsville, N. Y.:

I claim the within-described process of dipping the leather, either manufactured or unmanufactured, into heated liquid at a temperature of about 175 degrees, and suspending it in an atmosphere heated to about the same temperature, substantially as and for the purpose specified.

49,827.—Machine for Making Cement Pipe.—John E. Earle (assignor to John P. Lindsay), New Haven, Conn.:

I claim raising the core in the flask during the process of filling, and only as fast as the flask becomes filled, so that the top of the core is always down in the flask at or near the point of filling, substantially as and for the purposes specified.

49,828.—Machinery for Making Cement Pipe.—William Goodwin (assignor to J. P. Lindsay), New Haven, Conn. Antedated Aug. 28, 1865:

I claim, First, The construction and arrangement of the shoe or shoes, F, with a core and flask, when the said core and shoes rise as the flask becomes filled, substantially as and for the purposes specified.

Second, The combination of the flanges, f, with a revolving head, substantially as and for the purpose specified.

Third, The arrangement of the crane, M, in combination with one or more flasks, constructed to operate substantially as and for the purposes specified.

Fourth, The combination of the crane, M, table, B, and two or more flasks, substantially as and for the purposes specified.

49,829.—Machine for Making Moldings and Frames.—Gustave Heuze (assignor to himself and Edward Sommerkorn), New York City:

I claim, First, The hand screw, q, applied in combination with the leveler, J, and belt, I, substantially in the manner and for the purpose set forth.

Second, The tubular attachment, l', to the discharge spout, j, of the box containing the preparation, in combination with adjusting plugs, l', constructed and operating substantially as and for the purpose specified.

Third, The vertically adjustable box, H, applied independently of the leveler, J, and acting in conjunction with the same, substantially as and for the purpose described.

Fourth, The splitter, L, in combination with the belt, I, and leveler, J, applied and operating substantially as and for the purpose specified.

Fifth, A machine combining a saw, a molding cutter, a leveler and splitter, and a polisher, all constructed and operating substantially as and for the purpose described.

49,830.—Picker Check for Looms.—L. J. Labounty (assignor to himself and Allen P. Bickford), Lowell, Mass.:

I claim the combination of the bunter, c, made and provided with springs, as explained, with the adjustable holding frame, B, having adjustments, substantially as specified.

49,831.—Manufacture of Super-phosphates.—G. A. Liebeg, Baltimore, Md., assignor to Navassa Phosphate Co., N. Y.:

I claim the use of sulphurous acid, or muriatic acid, or chloride of sodium, as a substitute for sulphuric acid in the production of a super-phosphate from Navassa guano, or other phosphatic compounds.

49,832.—Skate.—Edgar Murray, New York City, assignor to Wm. J. Coombs, Brooklyn, N. Y. Antedated Sept. 1, 1865:

I claim the lever, e, formed with the cam-shaped clamp, f, in combination with the rod or bar, g, adjustable, as set forth.

And in combination with the said lever, e, clamp, f, rod, g, and nuts, i, I claim the clamps, k k, acting at the sides of the boot sole, as set forth.

49,833.—Sulky Plow.—Ira C. Pratt (assignor to himself and L. F. Pratt), Morton, Ill.:

I claim, First, The plank, A, to which the plow beams, B, are secured, connected to the draught pole, I, by joints or eyebolts, f, and operated or adjusted by the driver on his seat, through the medium of a lever and arm, or their equivalents, substantially as set forth.

Second, The adjusting of the plank, A, and consequently the plow beams and plows, higher or lower, with the axle, D, in order to regulate the depth of the penetration of the plows, by means of the plate, E, secured to one end of the plank, and provided with a series of holes, c, in a vertical line, through any one of which the bolt, b, passes into the axle, at one end, in connection with the slotted plate, C, through which the axle passes and the lever, F, attached to the plank, and bearing on the axle, substantially as and for the purposes set forth.

[This invention relates to a new and improved sulky plow, and is applicable to gang as well as single plows. It has for its object the ready adjustment of the plows, so that they will penetrate the earth at a greater or less depth, and raised entirely out of the ground when necessary, as in turning at the ends of a field, or in drawing the device from place to place.]

49,834.—Horse Hay-fork.—O. P. Secor, Chicago, Ill., assignor to C. L. Bellamy, Catskill, N. Y.:

I claim the tines, a a a a, each formed in a continuous curve, in one piece, with its shanks, b, which shanks converge and are connected together at their upper ends in the described combination with the cross bars, c c', catch, c f, springs, D, and eye, e, all constructed, arranged and employed in the manner and for the purposes specified.

[This invention consists in a novel tripping device for causing the fork to discharge its load; one which will admit of the fork being readily adjusted, so that the latter will hold or retain its load while being elevated, and which will also admit of the fork being cheaply constructed and easily manipulated.]

49,835.—Knitting Machine.—Asa Sessions, Jr. (assignor to Lamb Knitting Machine Co.), Springfield, Mass.:

I claim, First, The combination of the arm, C, hub, c, and bridge, B, with the slider, n, and bed piece, A, substantially in the manner and for the purpose described.

Second, The combination of the wire, h, or its equivalent, and the spring, k, when used in connection with the other parts of the machine, substantially as described.

Third, The spring, D, when used in combination with the other parts of the machine, in the manner and for the purpose described.

Fourth, The bridge, B, slotted as described, when applied to a knitting machine, as and for the purpose herein set forth.

49,836.—Grater for Spices and Fruits.—H. S. Shephardson, Shelburne Falls, Mass., assignor to H. S. Shephardson & Co.:

I claim punching a plate or plates for grates, so as to have a fin or lip, a throat and a conducting channel, substantially as herein described and represented.

49,837.—Sewing-machine Stitch.—J. J. Sibley, New York City, assignor to the Bruen Manufacturing Co.:

I claim the sewing machine stitch, described and shown in the drawing.

49,838.—Machine for Punching Horseshoes.—Samuel D. Turner (assignor to the Union Horseshoe Co.), Providence, R. I.:

I claim a machine for punching horseshoes, consisting of one or more elastic gage points, b b, operating in the manner substantially as described, for the purposes specified.

49,839.—Apparatus for Removing Hair from Hides.—Samuel S. Weed, Stoneham, Mass., assignor to Edgar M. Stevens and James L. Hall:

I claim, First, Removing hair and lime from hides or skins by means of a rotating cylinder covered with rubber, substantially as described.

Second, The combination of the cylinder, D, feed rollers, I and K, levers, L L, and treadle, P, substantially as and for the purpose described.

Third, The brush, W, when combined and operating with the cylinder, D, substantially as described.

49,840.—Castor Bottle Holder.—Alonzo E. Young, Dorchester, Mass., assignor to himself and John W. Haines, Somerville, Mass.:

I claim the improved manufacture of glass castor bottles holder, made not only with a disc, a plate and a flange to extend around and project below such disc, but with cups to open out of, and extend below, the disc, in manner as specified, the flange, under such circumstances, serving to hide the cups more or less from view when the article may be in use with its stand on a table.

49,841.—Castor Bottle Holder.—Alonzo E. Young, Dorchester, Mass., assignor to himself and John W. Haines, Somerville, Mass.:

I claim, in the manufacture of the castor or bottle holder made of glass and in one piece, the arrangement of the cups, feet, connection and handle-fastening socket, as specified.

49,842.—Electro-magnetic Regulator.—Francois Ferdinand Auguste Achard, Paris, France:

I claim an electro-magnetic apparatus composed of a sectional ratchet wheel, A, working beam, D, double ratchet, E, electro-magnets, F, and armature, O, constructed and operating substantially as and for the purpose herein shown and described

[This invention relates to an electro-magnetic apparatus which is appplicable for the purpose of operating boiler feeds or of regulating the pressure of steam or gases in closed vessels, and which also may be used for the purpose of operating car brakes, and for various other purposes.]

49,843.—Writing Fluid.—Henry C. Bailden, Edinburgh, Scotland:

I claim the use, for the purpose described, of paper tinted or colored with a coloring matter susceptible of being acted upon by sulphuric or other destructive acid, combined with the use of an ink composed of sulphuric or other destructive acid and a coloring matter, such ink being capable of discharging and changing the color of the paper, and changing or weakening the texture thereof in the parts written upon, substantially as herein set forth.

49,844.—Breech-loading Fire-arm.—James Dabziel Dougall, Westminster, Great Britain:

I claim, First, The combination of the breech-piece, E, its recess, e, the pin, c, eccentric, b, and barrel, A, with its annular projection, f, the whole being constructed, arranged and operating substantially as and for the purposes herein set forth.

Second, The projection, i, on the breech-piece, in combination with the notch, k, in the tongue, on the underside of the barrel.

Third, The pin, l, on the breech-piece, in combination with the inclined or curved notch, n, in the breech-piece, for the purpose specified.

REISSUES.

2,063.—Die for Stamping Rings.—Oscar M. Draper, North Attleboro, assignee of Vorgil Draper. Patented May 24, 1864:

I claim the combination of the separate, removable, centering piece, a, with the punch, C, the die, b, and the mold plates, A and B, or their mechanical equivalent, the whole being substantially as specified.

2,064.—Steam-engine Governor.—Bobert W. Gardner, Quincy, Ill. Patented Aug. 14, 1860:

First. I claim the governor operated as described, namely, by using the centrifugal force of the pendulum balls to close the valve, and the gravitation of the adjustable weight on the lever to open said valve, the two forces working against and independent of each other, substantially as herein specified.

Second, The spindle, o, of the governor, supported on the head of the valve stem, but unconnected therewith, in combination with a weighted lever tending to keep the several parts in close contact, and partly balancing the weight of the moving parts of the governor, substantially as and for the purpose described.

Third, The toes, l', on the upper end of the pendulous arms, l, in their arrangement with the sliding block or cap, n, and vertical valve rod, o, constructed and operated substantially as and for the purpose described, whereby the upward vibration of the governor arm is caused to act immediately and independently to close the valve, in opposition to the influence of the weighted lever.

Fourth, The combination of the lever, p, adjustable weight, q, link, r, step, g, valve rod, e, spindle, o, and pendulum arms, l, all constructed and operating substantially as and for the purposes herein specified.

2,065.—Hoisting Machine.—William Miller, Cincinnati, Ohio. Patented May 12, 1863:

First, I claim elevating or depressing the platform of a hoisting machine or elevator, by means of traveling worm wheels, gearing with corresponding screw jacks or segmental nuts.

Second, The combination of the described or equivalent actuating mechanism platform worm racks and worm wheels, for the purposes set forth.

2,066.—Hoisting Machine.—William Miller, Cincinnati, Ohio. Patented July 4, 1865:

First, I claim elevating or depressing the platform of an elevator or hoisting machine, by means of a single traveling worm wheel which meshes within two or more corresponding screw racks or segmental nuts.

Second, An elevating platform, supported by rollers, G, or their equivalents, on a single worm wheel, resting in worm racks or segmental nuts, substantially as set forth.

2,067.—Breech-loading Fire-arm.—B. S. Roberts, U. S. A. Patented Sept. 23, 1862:

I claim the relative position of the breech-piece hinge and spur to the line of bore by which a muzzle-loading musket may be converted into a breech-loader, which is capable of partially retracting a metallic cartridge without the necessity of cutting entirely through the stock or barrel of the arm, substantially as described.

2,068.—Breech-loading Fire-arm.—B. S. Roberts, U. S. A. Patented Sept. 23, 1862:

I claim the adaptation of arms, such as described, to the use of metallic cartridges, in combination with a hammer, a projection from the breech piece and a lock of the breech piece, when these three elements are so constructed and arranged as to prevent the arm from being fired in the usual way until the breech piece is locked against its upward tendency, caused by the pressure of the gas during a discharge of the arm, substantially as described.

2,069.—Apparatus for Carbureting Air.—Hugh L. McAvoy and Elias S. Hutchinson, Baltimore, Md., assignees of Hugh L. McAvoy. Patented Dec. 13, 1864:

First, I claim generating gas by forcing air through, or mixing it with, hydro-carbon fluid, by means of a partially submerged air-forcing apparatus, arranged substantially as described, to pass the air through the wheel.

Second, I claim using an air-forcing apparatus within a chamber supplied with air, through an automatic valve, or by any other means adapted to prevent the evaporation of the fluid when the apparatus is got in operation.

Third, I claim the employment, in connection with the vessel, A, and air-forcing apparatus, B, of a valve, H, adapted to automatically open when the appparatus is in operation, for the purpose of supplying air to be carbureted, and to close when the operation is suspended, in order to prevent the oil from evaporating, as explained.

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[See Judge Holt's letter on another page.]

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

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Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

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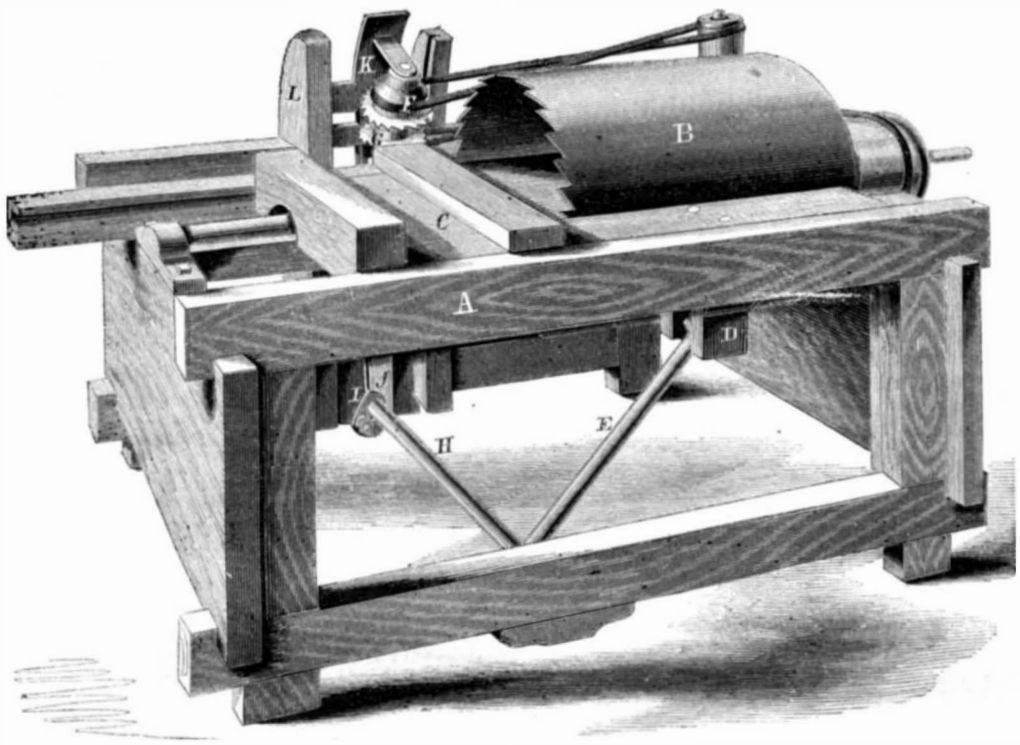
Improved Stave Machine.

This machine is intended to saw staves for barrels and joint the edges true for any degree of bilge—all at one operation. To effect this object the inventor provides a frame, A, with a barrel saw, B. The stuff to be sawed is fastened to the bench, C, which runs inside the saw, there being a slot where the saw comes, to allow it to pass.

To the lower side of the carriage, C, there is affixed a joint, D, to which the arm, E, connects; this arm operates the saws, F and G, so as to cause them to approach or recede from each other while running. This is done by having a short double-ended arm, I, on the shaft, H; to this arm there are rods, J, connected, acting on the guides, K, to which the saw



MOWRY'S STAVE MACHINE.

mandrels are hung. These guides move in slots in the standard, L, and have the effect, in connection with the other mechanism, of bringing the saws together or throwing them apart, both motions taking place at the same time.

It is easy to see that this will produce a regular swell in the body of the stave; for as the stuff to be sawed passes into the barrel saw, the jointing saws begin to move away from each other, until the center of the stave is attained, when they close up again, thus forming a regular curve throughout the length of the stave. Any bilge desired can be sawed on the stave by simple alteration.

This invention was patented through the Scientific American Patent Agency Oct. 4, 1864, by Charles Mowry, of Syracuse, N. Y. For further information address the patentee. The machine will be on exhibition at the State Fair, at Utica, commencing Sept. 12.

India-rubber.

A paragraph in the *North American Review* says, there are now in America and Europe more than a hundred and fifty manufactories of india-rubber articles, employing from four to five hundred operatives each, and consuming more than ten millions of pounds of gum per annum. The business, too, is considered to be still in its infancy. Certainly it is increasing. Nevertheless there is no possibility of the demand exceeding the supply. The belt of land around the globe, five hundred miles north and five hundred south of the equator, abounds in trees producing the gum, and they can be tapped, it is said, for twenty sucessive seasons. Forty-three thousand of these trees were counted in a tract of country thirty miles long and eight wide. Each tree yields an average of three table-spoonfuls of sap daily, but the trees are so close together that one man can gather the sap of eighty in a day.

American Iron and Steel Association.

The fourth quarterly meeting of the American Iron and Steel Association convened in Cleveland on Monday, Sept. 4, and was called to order by the President, E. B. Ward, Esq., of Detroit.

Returns show that the anthracite furnaces of the United States are not producing over one-third of their capacity. Thus the Government is now losing in this single branch of manufacture at the rate of not less than $1,000,000 per year in direct tax, and far more than that sum in indirect taxes.

The large rail mill at Danville has been stopped since the first of July, on account of the low price of iron, making it impossible to work at the rate of wages required by the operatives. The annual capacity of this mill is 33,000 tuns of finished rails. The managers of other large rail mills are debating the expediency of stopping their works until the cost of production and the market price become so proportioned that they can run at a living rate.

Philadelphia, with eleven rolling mills, at a capacity of 26,000 tuns, is now producing but about forty per cent of that amount. The steel business of that city is fitful and generally dull.

Pittsburgh, with thirty-two iron and six steel establishments, is now producing less than one-third their capacity. Twelve iron and two steel works are idle. But one of five blast furnaces in the city is in operation.

In Cincinnati, up to within the last two weeks, every branch of the trade was very much depressed, and pig-iron makers generally complained of an actual loss in their manufacture. The mills generally were running on half time, and some only continued in operation to supply certain specialties. The making of merchant iron would hardly return cost.

FORCE EXERTED BY VEGETABLE GROWTH.—Some idea may be formed of the force exerted by vegetable growth from the fact stated in reference to an enormous specimen, *Agaricus cartilagineus* (mushroom), which was sent to the British Museum. It was found growing below the pavement in the Goswell road, and its *mycelium*, or filamentous body, from which this fungus growth is developed, which, in this case, was developed into a enormous spongy mass, had, in pushing up its many-headed pileus, raised a stone weighing two hundred weight, and measuring four feet square.

PRICE OF CHAMPAGNE IN PARIS.—In the U. S. District Court, San Francisco, W. B. Farwell, late Naval Officer of that port, testified that he went to Europe under the instructions and at the direction of the Treasury Department at Washington, for the purpose of ascertaining the value of wines at the place where manufactured, and as a part of the result of his observations, ascertained that the "Eugene Cliquot" champagne sold in jobbing lots in Paris at 7 francs (about $1 40) per bottle for the best quality, and 5 francs (about $1) per bottle for the next best quality.

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